REPORT RESUMES

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THE FEASIBILITY AND ROLE OF STATE AND REGIONAL NETWORKS IN EDUCATIONAL BROADCASTING.
BY- SKORNIA, HARRY J. AND OTHERS
NATIONAL ASSN. OF EDUCATIONAL BROADCASTERS
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A CONFERENCE WAS CONDUCTED IN RESPONSE TO THE NEED TO KNOW MORE ABOUT THE OPERATION, PLANNING, AND FEASIBILITY OF LIVE INTERCONNECTED STATE AND REGIONAL NETWORKS FOR EDUCATIONAL TELEVISION AND RADIO. EIGHT MAJOR SESSIONS WERE HELD--(1) ORIENTATION, (2) WHAT HAVE WE TO DISTRIBUTE, (3) ARE NETWORKS TECHNICALLY FEASIBLE, (4) LEGAL CONSIDERATIONS, (5) EFFECTS ON THE EDUCATIONAL COMMUNITY, (6) STATUS REPORTS (REGIONAL AND STATE), (7) COSTS, AND (8) ADMINISTRATION PROBLEMS AND SUMMARY. DR. JOHN C. SCHWARZWALDER, CONFERENCE CHAIRMAN, SUMMARIZED THE CONFERENCE PROCEEDINGS. HIS SUMMARY IS INCLUDED IN THE REPORT ALONG WITH APPROXIMATELY 50 PRESENTATIONS. NOTES FROM THE DISCUSSIONS WHICH FOLLOWED THE FORMAL PRESENTATIONS ARE ALSO INCLUDED. IT WAS AGREED THAT THE TWO CHIEF GOALS OF NETWORKS IN EDUCATIONAL BROADCASTING ARE THE EXTENSION OF EDUCATION AND THE PRESERVATION OF ACADEMIC FREEDOM. (JC)

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The Feasibility and Role of State and Regional Networks in Educational Broadcasting

PROCEEDINGS OF THE CONFERENCE

September 9—11, 1959
National Education Association Building
Washington, D. C.

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The Feasibility and Role of State and Regional Networks in Educational Broadcasting

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Edited by Betty McKenzie

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FOREWORD

The conference, whose proceedings are contained herein, was conducted by the National Association of Educational Broadcasters, at the invitation of the United States Office of Education, under the provisions of Title VII of the National Defense Education Act.

There was a need to know more about the operation, planning, and feasibility of live, interconnected state and regional networks, for both educational television and educational radio. It was felt that a conference was the most efficient way in which this knowledge could be achieved.

It is the hope of both the Office of Education, United States Department of Health, Education and Welfare, and the National Association of Educational Broadcasters that this report will be found useful to the interests of education in the United States, to which it is dedicated.

CONFERENCE PLANNING COMMITTEE

Dr. John Schwarzwalder, Chairman

Lawrence Frymire, Chairman, Radio Planning Committee, National Association of Educational Broadcasters; Manager, Stations WKAR-AM-FM, Michigan State University, East Lansing, Michigan.

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The committee was generously supported in its planning by the suggestions of Dr. C. Walter Stone, Director, Educational Media Branch, U. S. Office of Education, Department of Health, Education and Welfare, to whom the committee's grateful thanks.

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Session I

ORIENTATION

Dr. John C. Schwarzwalder, Chairman

Session I

ORIENTATION

Greetings and Brief Remarks by

The Honorable Arthur S. Flemming

Secretary
Department of Health, Education and Welfare

As you know, we have had a very interesting time during the past year administering the National Defense Education Act. I am sure that those who have referred to this Act as a landmark in the field of education as far as the Federal Government is concerned have been correct in this reference.

It seems to me that when Congress was asked to consider the various titles that have been included in the National Defense Education Act, we were, in effect, at the crossroads. There had been a great deal of talk about the type of help and assistance that the Federal Government might give to the total educational program of our nation. In passing the National Defense Education Act, Congress decided to move out of the realm of talk and put the Federal Government in a position where, in certain specified areas, it could be of help and assistance.

All titles of this Act are important, and—in my judgment—all the titles of this Act, as they are being administered by Commissioner Derthick and his associates, are making a contribution to the strengthening of our total educational program. However, it seems to me that the title that has made possible the convening of this conference is a very exciting one—as one thinks in terms of the programs that conceivably will be launched as a result of the research activities, as a result of the conferences, and as a result of the demonstrations that will take place under the provisions of this title.

It seems to me that those of you who have come here for the purpose of participating in this conference are coming to grips with an issue that has truly exciting possibilities.

There isn't any doubt in the minds of anyone today certainly that television does provide us with the opportunity of strengthening our total educational system. The question is whether or not as a nation we will take full advantage of the opportunity and whether or not we will pursue the opportunities that it presents with a sense of urgency.

I am very much aware of the fact, as you are (and you are to an even greater extent than I am) that there are those who will persist in shutting their eyes to the opportunities that television presents in the field of education. They will think of a dozen and one reasons why it cannot be utilized as an asset.

Somehow or other those who are working in the field of education, and particularly those of you who are working in this area, are going to have to challenge and stimulate these persons to the place where they stop worshiping the status quo and are willing to launch out and take advantage of the opportunities that television presents. I suppose, by and large, this is the group on which we should concentrate more than any other group if we are to take full advantage of the opportunities that television presents.

It seems to me that in coming to grips with the kind of issue that you will be coming to grips with during the next few days, you will be serving a very constructive purpose—as we think in terms of dealing with those who think of a dozen and one reasons why you can't use television effectively in the field of education. You, I am sure, are going to eliminate—as a result of your discussions and as a result of the programs that will come out of these discussions—some of the arguments that are being used today in such a manner as to stand in the way of effective use of this medium in education.

But I'm sure that you are aware of the fact, as I am, that not only do we need to confront those who are reluctant to move in the direction of taking advantage of this opportunity, but we also need to deal with those who possibly become overly enthusiastic in terms of utilizing this particular medium. They can go, or attempt to go, so far as to get in the way of sound, steady progress in the use of television in the field of education.

I am sure that a group such as this will caution such persons and will provide them with the kind of leadership that will keep them from becoming too enthusiastic and losing their perspective and sense of balance.

In other words, what I am trying to say is that here is an opportunity, but it is an opportunity that we are not going to take advantage of unless we are provided with sound leadership. I know that our Advisory Committee—which has been assisting the Commissioner of Education and his associates in the development of the program under Title VII is providing us with the finest kind of leadership. We are deeply appreciative of all they are doing along this line.

The kind of leadership that they are providing is leadership which is making it possible for us to utilize our funds in such a manner that many, many other persons throughout the country will be put in a position where they can exercise sound, constructive leadership in this area. I am more than happy that the Advisory Committee to the Commissioner of Education decided to provide the funds for a conference of this kind, because this is one of the ways in which to provide our nation with the leadership that is needed.

I am sure that out of your discussions here there will come ideas and suggestions that will be directed not only to our local communities, to our states, to our institutions of higher education, but also ideas and suggestions that will be directed to the Federal Government. And I can assure you that those ideas and those suggestions will be given the most careful consideration.

And I know that Commissioner Derthick and his associates will react to them one way or another. They may not always agree, but if they don't agree I am sure that they will indicate _why_. But we are trying to create an atmosphere which is not only receptive to new ideas but which does something about those new ideas.

I have been close enough to the field of education to know something about the pioneering activities that have been carried on by many of you who are gathered together in this room this morning, and I personally want to express to you my own deep appreciation. I am sure that all of us who have been associated with education know it is not too easy to get people to accept new ideas, new methods, new approaches. But, fortunately, we have always had a group of people who are perfectly willing, in season and out, to urge the acceptance of new ideas, new methods, and new approaches.

This has been characteristic of the spirit which has motivated those of you who have been engaged in this pioneering activity. We are indebted to you. We know that because of what you have done in the past you are going to continue to provide us with vigorous and effective leadership.

We want to do everything we possibly can to support your efforts to make sure of the fact that television is used in the most intelligent and the most effective possible manner.

Again, thank you for your willingness to come here and spend this time. Personally, I will look forward to becoming acquainted with the results of your deliberations here, and I will be more than happy to do everything I can to help carry forward this tremendously significant program.

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Session I

ORIENTATION

Greetings and Brief Remarks by

Dr. Lawrence G. Derthick

United States Commissioner of Education

Naturally I am very pleased to welcome you for this conference in which we are partners, but, of course, there's nothing new in our working together with you on the part of the Office of Education. Commissioner Studebaker began this partnership many years ago with radio, and then Commissioner McGrath came along and worked shoulder to shoulder with you to obtain the 256 television channels now set aside for educational use. Then Commissioner Brownell followed with his support to activate these channels.

And now, of course, I welcome you once more in your discussion of a plan which has already aroused much interest in educational broadcasting circles.

Communications are the arteries which bind society together, and research is vital if we are to keep the lifeblood of information flowing toward greater understanding between people. I would be remiss this morning if I did not tell you of my faith in the application of sound research methods to the problems which vex education today regarding the values inherent in the use of television, particularly in our schools.

As you know, provision has been made to do just this in Title VII of the National Defense Education Act, where television holds a most prominent place in the list of new education media to be investigated and studied. I am convinced that the results of this research now already under way will bring forth many valuable findings that will help us in our evaluation and development of this new medium of education.

In connection with the recent establishment of the Educational Media Branch in the Office of Education, may I also take this opportunity to assure you of the continuation of our previous services in radio and television. They are definitely an essential part of the new branch and as such will continue with Dr. Dunham, Dr. Lowdermilk, and Mrs. Broderick serving in their respective roles, as they have over these many years, the cause of educational broadcasting.

Nor should I let this opportunity pass to tell you of our great interest at the Office of Education in training teachers to use the medium of television. We are very happy that so many of the research grants made this first year of the program's operation have included in their purposes the training of teachers and the experimental use of television in actual classroom situations. Now, for the purpose of your conference on the feasibility and role of state and regional networks, this is important—today essential—to the proper growth and development of both radio and television.

With networks already operating in three states—Oklahoma, Alabama, and Florida—and at least ten more planned in other states to serve at all educational levels, it is time we took a good long look into the future. Whether the trend be state-wide, regional, or, in time to come, a national network to serve this special and compelling educational need in our country, I do not know. Perhaps we shall need a combination of these geographical units.

Naturally, we anxiously await, as Secretary Flemming has so forcefully said, the proposals which will come from this meeting. This is a time of great issues and great events and of problems which seem to have acquired astonishing dimensions. It is also a time in which technology has provided us with tools capable of coping with our problems. How fortunate are we who have any part in the utilization of this technology. In our hands lie the responsibility and the privilege for so much that this wonderful new age can do to carry forward the promise of human progress.

And, as a sobering thought, the limitations of the tools now ours for the using are largely those that we as individuals put on them.

Technology has given us the means to make our world a better world than it has ever been. It is for us now to implement them to their full potential. Working together with vigor and dedication we can move forward to this goal.

Session I

ORIENTATION

Greetings and Brief Remarks by

Dr. Lyle Ashby

Deputy Executive Secretary
National Education Association

I am happy as I can be to welcome this significant conference into this new headquarters building of the National Education Association—especially if it will do something to contribute to the ongoing significance of the National Defense Education Act, as I am sure it will. Any time we can do anything to help HEW, the Office of Education, in making this Act more effective, we want to do it.

I certainly don't profess to be an expert in the topic to which this conference is going to address itself. But there are a few things we do know. One of them is that education is about the most important business that people of this country can be engaged in. We know that we need to utilize every resource at our disposal.

I happen to think, in using these resources, we should utilize the known principles of learning to govern their use. But since our understanding of principles of learning is subject to change and to growth, the teaching profession must always encourage scientific experimentation and tryouts of new ideas.

We ought not to be afraid of tools that will teach many at once under the proper circumstances, any more than we should be afraid of a machine which may help to teach one youngster at a time better. I am sure that educational broadcasting is here to stay, because it has a uniquely useful contribution to make to education. And your problem here in the next few days is to find out how to use radio and television media with increasing effectiveness at both the sending and the receiving ends.

You are going to deal with the state and regional network idea, the technical and legal problems. You will consider status reports. But the most significant thing, it seems to me, with which you will be dealing is the effect on the educational community. This is the main issue, and this is the reason for the solution of the legal and engineering and other problems.

I think the NEA has had a long interest in television. We were one of the founders of the JCET quite a number of years ago now. When our program was expanded a few years ago, one of the first things we did—one of the things our audio-visual people had wanted to do for many years—was to immediately add to the staff a consultant on educational television in the person of Dr. Harold Wigren. We have been holding some very significant seminars in this field.

I thought I would like to read to you, for those not familiar with it, the latest resolution of the NEA in the area:

"Fully aware that there is no substitute for the personal contacts of teachers and students, the NEA recognizes the educational potential of television, radio, motion pictures, and related means of communication. It, therefore, encourages extensive experimentation and research in the more effective use of these resources in education. The Association urges vigorous action to develop the potential of television, both closed-circuit and broadcast, and other communication resources for use in the classroom, especially with reference to the possibilities they offer for visualizing instruction.

"It supports the use of Federal funds to stimulate the development of communication resources in education."

I sincerely hope that this conference is going to live up to your expectations and to the expectations of the officials of the Office of Education, and I'm sure that with the quality of personnel that has been assembled here—and I think the people who planned this program are to be congratulated for this—this conference will achieve a great deal in the more effective use of television in our schools throughout the country.

Session I

ORIENTATION

Greetings and Brief Remarks by

Mr. William G. Harley
President
National Association of Educational Broadcasters

If those of us in educational broadcasting believe in what we are doing, if we feel that the programs we present are truly worthwhile for people in our local communities, it follows that it should be worthwhile to extend these benefits to people of many surrounding communities.

Surely an aim of any educational agency is to hold fast to that which is true and of good report. But let us not hold it so fast, so close, that we fail to make the established patterns of thought, together with their challenges, widely available to all who can benefit.

Education, which gave birth to technology, has sometimes failed to take advantage of its child's talents. And the possibility of networking the programs of educational broadcasting—as the derivation of the word suggests, to cast or scatter the seed even more widely—is certainly a potential worthy of our study and consideration if these electronic tools are to come into their full usefulness.

NAEB is very pleased to be cooperating for the second time in two years in a Washington conference with the Department of Health, Education, and Welfare and the Office of Education. In 1958 we held a joint conference on educational television in this city, and we are very grateful for this additional opportunity, provided by a Title VII contract under the National Defense Education Act.

Our thanks, too, to the National Education Association for its splendid cooperation in helping us with arrangements, particularly in making this beautiful and, perhaps even more important, air-conditioned meeting room available for the sessions of the conference. And certainly we want to express our gratitude for all of the very gracious words of welcome provided by the preceding speakers.

NAEB—which has as its purpose the promotion and development of all the electronic media in the service of education and true public interest—welcomes the opportunity to conduct this conference on state and regional radio and television networks, as another forward step in providing a record of the constructive and beneficent possibilities of these new agencies of mass communication.

It is our fervent hope that this conference can aid all of us in educational broadcasting to bring into view horizons beyond our immediate line of sight and to help television and radio, as the Greek phrase has it, to become what it has in it to be.

Session I

ORIENTATION

Statement of Background and Purpose

Dr. C. Walter Stone

Director, Educational Media Branch
United States Office of Education

I think it might be useful if I set into context a little bit more deeply the provisions of Part B of Title VII of the National Defense Education Act (under the provisions of which this contract has been negotiated); tell you a little bit about some objectives which have been approved by our Advisory Committee with respect to carrying out these aims; set the contract in relationship to some others which have also been negotiated; and then identify, if I may, a few problems, purposes, and assumptions which it seems to me must underlie the holding of such a conference.

Let me say with respect to Part B that the law mandates three kinds of activities subject to approval by the Advisory Committee as recommendations are put forth to the Commissioner—

1. The carrying out of studies and surveys which may lead to increased or improved use of the education media: status studies, feasibility studies, Where are we? Where can we go from here?—this kind of examination of the field in which we are working.

2. The publication of handbooks, guides, manuals, and other materials which will be helpful in carrying forward the purposes for which the National Defense Education Act was passed and for which Title VII was included as a part.

3. Upon request, to provide such advisory assistance, counsel, technical demonstrations, and other sorts of demonstrations as may present to school administrators, the public at large, and those who support education, the information they need on the basis of which to choose directions in which education should be moved.

This is the mandate set forth in Title VII, Part B.

The Advisory Committee at its last meeting approved a set of general objectives, and, if I may, I'd like to read those to you, because they undergird the whole of the dissemination effort of which this conference is one part.

The Committee says that the objectives for the dissemination program as they would recommend them are these:

"To provide information about research completed, in process, or projected.

"To provide more information about significant programs in teaching practices wherever this can be obtained and from whatever source it can be found.

"To increase the accessibility and the availability of new media by bibliographic and by direct means.

"To directly improve, where it is possible to do so, the educational use and the training of teachers for educational uses of new media.

"Finally, to develop national goals, standards and guidelines for improved educational use of the media."

To date, some fourteen contracts have been approved and negotiated or are still in the process of being negotiated to carry out these objectives. Among these are contracts with a variety of professional associations and educational institutions where there are specialists or special interests concerned with the problems with which Title VII is faced. Let me identify just a few:

We have a contract at the moment with Indiana University where specialists in the audio-visual field and also in the school-library field are looking at the problem of establishing bibliographic control of the media, ways in which we can help the teacher or the school administrator find the materials he needs without wading through a multiplicity of incomplete guides and indexes and so forth. We face a kind of bibliographic chaos in the field. Examining the possibilities of what may be done is a contractual activity being supported at Indiana University.

We face a somewhat similar situation in the field of educational media research. We need more summaries. We need more guides. We need to establish some type of control of it so researchers, as well as those who want to apply the results of research, can get at the information they need.

There is a contract with Columbia University to again assess the feasibility—indeed the need— for establishing some type of control of media research information, including that which has been done in behalf of television.

We have a contract with the National Educational Television and Radio Center to produce a series of filmed case-study reports which will tell us not how to go about the teaching of language, science and mathematics, but what is being done and where. A report to the field: Here's where we are; here's what is being done—again a kind of inventory, a national inventory if you like, of programs, problems, and opportunities which are represented in these several fields of teaching of language, science, and mathematics.

I could go on to identify a number of other areas in which we are undertaking surveys and studies of this character. As you can see, it represents a major part of the dissemination activity at this first stage, and I would like to say that in the background of this conference, and as one of its chief purposes, was identified this inventory activity—Where are we now?

Now, our normal procedure in negotiating contracts under Part B of Title VII has been to identify first the need for this particular kind of activity; then to review the problem with specialists — in particular to approach those associations and professional groups most competent to deal with the problem and who may have been dealing with the problem over a long period of time—to ask their advice; and then to approach leading professional membership organizations in the field, where there are experts on the matter, to think about the problem and carry the ball forward.

We negotiate our contracts not just for doing a particular job, however, but for thinking about the problem as well, and also for acceptance of the partnership responsibility, which is implicit in thinking about such a task.

Now, more specifically about this meeting and the contract which was negotiated with the National Association of Educational Broadcasters. We need desperately more information available for those who are administering school and college programs, who are teaching, or who are responsible for obtaining support regarding state and regional network possibilities for the utilization of TV.

We need to know what has been done and where. We need to know the chief problems and pitfalls which are going to face educational personnel as they move in this direction.

We need to know what have been the most successful patterns of operation and of cooperation.

We need to know what opportunities lie ahead, and we need to know—as we choose a particular direction in which to move—the particular type of network and perhaps, what the alternatives might have been.

In short, What are the chief contributions which state or regional networks can make in harnessing educational radio and television efforts for the improvement of instruction?

This is the background and this is the purpose of this conference—to answer questions of this sort.

Now it does seem to me, and perhaps this is a personal point of view, that there are certain assumptions which must be implicit in holding a meeting such as this and in carrying forward its several sessions.

First, radio and TV have in many instances proved themselves as effective educational tools. Research and studies now under way across the country are, of course, discovering new ways to use the media, singly or in combination with other approaches. They are also looking at the specific nature of the contributions to learning which can be made by these several media. As a matter of fact, as has already been indicated, approximately half of the Title VII grant awards for research activity are in this area.

But we have demonstrated in a great many instances that radio and television are effective instruments, so the question now is quality, and Where do we go from here?

Second, the very nature of these media is such, in terms of costs, technical skills required, production needs, and so forth, that maximum cooperation is needed if we are going to employ these resources to the fullest. There is important work we can do as individuals, but there is much more important work which can be realized as we work together.

Third, we are concerned with the uses of radio and television for improvement of instruction for the individual and not with something labeled "mass education," which is a contradiction in terms any way you choose to look at it. I'd like to elaborate on that if more time were available.

Finally, whatever methods we develop and may employ for the use of radio and television, and whatever cooperative devices—including state, regional, and subregional networks—we may invent for the sharing of our resources, we need most urgently, I think, to consider the problems of policy and the problems of control so that we remain the masters of the machinery we create and do not leave that to others who, in the absence of adequate safeguards, may rush in simply to achieve ends which may or may not reflect the goals of the American people as a whole.

This is the background again of some assumptions which, it seems to me, underlie the conduct of this conference.

In closing, I would like to mention on my own behalf, if I may, the debt of gratitude which we owe the National Association of Educational Broadcasters and its staff for thinking about this problem with us, for calling you together, and for moving forward with this conference.

Session I

ORIENTATION

Statement of Perspective and Problem

Mr. Richard B. Hull

Director, Radio and Television Broadcasting
Ohio State University

I was instructed to attempt to give you a little perspective on the problem here, and it seems to me the fundamental problem perhaps is the adjustment of man to the machine.

We have already heard, until we are tired, of the Industrial Revolution...the steam age...the electronic revolution...the machine society we now live in...the problem of East-West tension...the growing problems of education which Sputnik punctuated and did not create.

We are familiar with the earlier preoccupations of philosophers like Ruskin and his "What do we [the British] have to say to India?" Or Samuel Morse who wondered, "What hath God wrought?" for his first message.

And now what we are facing is the circumstance precisely that Mr. Malthus was afraid of a few years ago, with the present population of the planet somewhat in excess of 2.5 billion, with 4.8 billion predicted for the year 2000, and 6.7 billion predicted for the year 2050—the more immediate effects of which we will see during the next fifteen years in school populations. What are we going to do about it?

This means adopting technology in some form or fashion to meet our problems in the same way that industry and business have, in the same way and in a different way.

Dr. Stoddard, now Dean of Education at New York University, said one time, and I remember this very clearly, that education is the only business which does not welcome new customers—though we have a lot of new customers.

As part of the perspective, I was asked to try a quick overview of some of the things that have happened during the past ten years and during the past thirty-five.

Curiously, the National Association of Educational Broadcasters, which co-sponsors this conference, formed in 1925, made its first official action a plea to the national meeting of state governors asking for reserved radio channels for the purpose of education. Their next step was to plan a nationwide network.

Now, our problem here is networks. And networks are really nothing but an economic device for distribution. It's simply a way of sharing the wealth or sharing resources. The national networks illustrate this very well. And there is a reason entertainmentwise why Chicago, New York, and Los Angeles in particular have been the center of network program origination.

Now, the NAEB has a tape network of over a hundred stations across the country. It was primarily concerned with general permissive adult education.

Then came television. In 1950, WOI-TV at Iowa State College was the first nonexperimental television station to be owned and operated by an educational institution. The same year Syracuse University began producing educational programs for commercial television stations and established the first courses of study in television leading professionally to the M.A. degree.

In 1950 Western Reserve began the first credit television courses, broadcast over Station WEWS in Cleveland.

In 1951 the Fund for Adult Education, an independent organization established by the Ford Foundation, gambled its future on the promise of television for adult education. It subsidized the NAEB to train personnel for educational television and established four other organizations:

(1) The Joint Committee (now Council) on Educational Television, to pursue and protect reservation of television channels.

(2) The National Citizens Committee on Educational Television, to encourage citizen interest in constructing television stations for education.

(3) The National Educational Television and Radio Center, which is the national network using film and kinescope.

(4) The Television Committee of the American Council on Education, to host national policy meetings in this area transcending all levels of education.

And then two years later the Federal Communications Commission created a new station category, the noncommercial educational television station, and at that time reserved 242 television channels for that purpose, a number since supplemented and added to.

The first station in this new category was the one our conference chairman, Dr. John Schwarzwalder, established at the University of Houston, KUHT, which has now been giving credit courses for some six years. This is standard operating procedure.

There are now at least 44 educational television stations on the air.

In addition to those operated noncommercially, five other institutions have commercial or semicommercial outlets: Iowa State College, the University of Missouri, St. Norbert's College, Loyola University of New Orleans, and Notre Dame.

Michigan State has abandoned public broadcasting on its UHF station and instead uses it, in effect, as closed circuit. The university has constructed a VHF station, which it leases half-time to a commercial outlet and uses the other half-time for education.

Total capital investments in these stations—or individual investments, rather—might range from $100,000 to $1,700,000, operating costs from $50,000 a year to $750,000 a year. Ownership? State college or university, community educational corporation or foundation (in one case fifty-three school districts comprise a corporation), a public school system, a state department of instruction, a territorial department of education, a public library, or in two cases (Oklahoma and Alabama) a state commission or network.

At the outset these stations were thought to be vehicles for free-choice general adult education, cultural entertainment, and in-school and on-campus enrichment. They were not conceived of as vehicles for formal instruction.

A new notion emerged in 1954-55, chiefly due to the efforts of another branch of the Ford Foundation, the Foundation for the Advancement of Education. The enthusiasm about this aspect of television applied to education has been such that it has almost obscured the original concept—so television as a teaching instrument within the framework of formal education is more our preoccupation today.

This whole development in radio and television over the past twenty-five years has begun more and more to coincide with the teacher, fiscal, and quality crises in education. Much of its energy has been generated from that fact.

Now, collectively, these stations and the various closed-circuit television installations, of which there may be as many as 400 now, have taught nearly every major subject.

You might be interested in this data:

At Michigan State University, a 1958 survey (based on contacts with 200 institutions) showed that 53 universities, 34 colleges, 5 institutions, 20 public schools, 3 educational television networks, and 2 state departments of public instruction—117 in all—were using TV facilities in their educational programs, a total of 464 courses during 1957-58.

That represented an increase of 113 per cent over the total course listings for the whole period 1951 to 1957. This sharp increase is particularly marked in social science, which increased 109 per cent; in physical science, which increased nearly 200 per cent; in mathematics, which increased 313 per cent; in language, which increased 158 per cent; in business, which increased 156 per cent; and in English grammar, which increased 163 per cent.

Social sciences represented a little more than 19 per cent of all telecourses offered, English about 13 per cent, physical science 12 per cent, mathematics 6 per cent, foreign language 7 per cent, and business 5 per cent.

Russian language, not previously listed, was offered in five telecourses that year and in many other places this year. There was one listing for Latin—for whatever that may imply.

One of the problems we face throughout this conference is where to place television in its use in this whole complex. The above survey showed that the administration of televised education was quite diverse. Thirty institutions placed the responsibility in extension divisions, and twenty-three in departments in cooperation with extension. Nineteen relied upon television departments, four on deans of colleges, two on audio-visual departments, and others on one or more of the chief administrators of the school.

The Fund for the Advancement of Education and the Association of American Colleges for Teacher Education began an experiment last fall for in-service teacher training in physics. That experiment notably had seven Nobel Prize winners on its faculty and involved the entire nationwide NBC television network, with more than 5,000 students taking the course for credit in cooperation with some 240-odd colleges and universities. This meant the total institutional involvement in 1958 was 358 institutions, plus 600 school districts in addition.

All of you are familiar with the whole range of application here: Pittsburgh and its station WQED, with instruction on every grade level from kindergarten through the sophomore year in college, including a high school degree; the Chicago City Junior College experiment at WTTW; the new sharing-of-resources concept at Corvallis, Oregon, where one transmitter at the state college embraces the campus of a teachers' college and also of the state university, where they already are anticipating increasing enrollments and lessening numbers of qualified teachers. A philosopher at the University of Oregon will address classes on three campuses. A chemist at Corvallis will do likewise...an education professor from Monmouth. So they spread this over an entire state.

At the University of Houston, which we have mentioned before, it is standard operating procedure to offer freshman and other courses by television. Some courses are offered only by television to freshmen, and class enrollments must reach or exceed three hundred before a course is televised. Students view at home and attend recitation classes on a rotation schedule, thus permitting greater use of classroom buildings.

In Lincoln, Nebraska, the University of Nebraska station provides instruction in algebra, physics, geometry, English, and other subjects to a whole array of high schools —especially rural high schools, where the median enrollment is sixty, with the teaching problems you might anticipate.

And this is indicative of problem areas in other places in the country where physics, mathematics, and other science subjects are either not offered or are offered in alternate years—and when they are offered, serious questions arise about how adequate the instruction is.

Closed-circuit installations—which are little networks—you know about. The biggest program perhaps is in Hagerstown, Maryland, where all the buildings or most of the buildings in Washington County are linked together by a six-channel coaxial closed-circuit network system. Others are Fort Monmouth, New Jersey, with three hundred classrooms for Army training; Houston, Texas, where the University of Texas Dental School is literally built around a small closed-circuit television system; and here in Washington, the elaborate color television network in the Walter Reed Hospital complex.

Dr. Ray Carpenter at Penn State, who is senior member of perhaps a score of researchers in educational television who have worked on the problem for the last nine years, says: "Probably no new development in instruction situations has been more thoroughly researched than educational television."

Most experiments to date, beginning with the first one in the Navy Special Devices Center some ten years ago, have seemed to indicate that students learn as well from TV as they do in conventional instructional situations. The research now, says Dr. Carpenter, is concerned with two things. The more they pursue this the less certain they are that there is a standard, conventional instructional situation. And the concern now is not with the comparison of one against the other, but how to create optimum learning. And this is an important thing in our network exploration.

We are familiar with the varied reactions of newcomers to educational television in any form—especially on the university level, where the skepticism-and-fear phenomenon appears too often. An experienced television observer can almost anticipate the objections on a new campus: No opportunity for discussion, destruction of student-teacher rapport, loss of academic integrity through popularization.

The fact is that these objection reactions parallel those voiced at the introduction of almost any new device or method.

Dr. Edgar Dale at Ohio State University (one of whose hobbies is the exploration of cultural change, as technology affects cultural change) told me once that when the free public library was first introduced into Great Britain, a great deal of objection occurred. This was thought to be a kind of mass phenomenon which would degrade morals, particularly those of young gentlemen. So to counter this, the advocates of the free public library suggested if they had such institutions the young men would keep out of taverns—whereupon the brewery interests opposed the whole proposal.

One of the deeper concerns in universities and in public schools is that the instructor is frankly afraid of educational television because it takes more preparation time. Some people call that laziness. It demands a better-planned presentation.

For the first time—and this is an important point—he is on view to his colleagues. He can no longer hide his virtues or sins, as the case may be, behind four walls. And the problem of technological replacement crosses his mind.

On the university level, departments of English in particular seem so far to have an allergy to television, whereas the science departments and the math departments have been quite friendly.

We still have an unsolved problem—payment of the TV instructor. Shall it be overtime pay, released time from teaching duties, royalty payments? Most universities have still dodged this problem, with released time the commonest solution.

In places with an agricultural or general extension tradition, this is not a problem for the extension teacher—because television or radio is simply one more device, like an automobile, to get from here to there to do the teaching.

Part of this cultural-change complex is that most academic staff members in universities secure professional advancement from publishing. If you list a score of things, this is one of the key ones. And for reasons which are not logical, except perhaps to a cultural anthropologist, both radio and television are regarded as subacademic by many departments in many institutions. Therefore staff participation in these media is regarded by department chairmen either with indulgence, as a kind of youthful folly, or with sharp criticism and the admonition to publish, not to broadcast.

So we have a problem of status recognition.

The whole business of electronic tape recording has begun a revolution as significant for education and industry as the invention of the telephone, the typewriter, and the motion picture.

Ampex Corporation led the field with its new video recording device with which you are familiar. And after a patent exchange, RCA developed its own version of this electronic photography and has three models, one in production, two in prospect:

1. The Senior Tape Recorder, which is like the Ampex.

2. The Junior Tape Recorder, to be on sale sometime in the next two or three years for $7,000 to $10,000—for use in schools, the Army, and other applications.

3. The See-Talk Box, so-called, a home model, which it is hoped will sell at $1,000 or less—a cartridge-fed machine which could be used for schoolroom application anywhere, with or without a network, and which would be supplied with cartridge-type, plug-in learning tapes.

The next twenty years, in my opinion, are going to see a transition in photography from a chemical to an electronic base. The whole implication here—for libraries, archives, lecture, demonstration, student self-observation in training, and so on—is apparent and is a key element in networking per se.

General Electric's Dr. Paul Chamberlain, who is present here, has said there will be more educational television station transmitters than commercial transmitters, excluding closed circuits, in this country in the next ten years. American Telephone and Telegraph in its last quarterly report of 1958 devoted four out of eight pages to describing educational television and offering the services of local telephone company managers to school and college officials in making plans.

There, then, is a hasty and almost too lengthy background, in terms of time available to us here.

Let me conclude in this fashion: Networking is an old concept as electronics go in this country. It must be, in broadcast terms, nearly thirty-five or forty years old. You can network on radio in a number of ways: a telephone line; an audiotape recorder; from an airborne device as they are doing on the DEW line; by disc recording or by tape recording, using the mails for distribution; or by microwave.

In educational television for short distances you can use telephone lines for network installations—or now videotape. Or, as they have done the last several weeks, the Atlantic cable with a slow scan device, coaxial cable, microwave, airborne, scatter wave, kinescope, and film.

Now, around this country we already have in radio one national 100-station network, and in Wisconsin, a 10-station interconnected state radio educational network.

In television the National Educational Television and Radio Center with kinescope and film serves 26 states and Puerto Rico. It is about to embark on videotape networking.

Alabama, Oklahoma, and Florida have networks—operating and in prospect.

The Southern Regional Education Board has a 16-state network possibility.

Studies are being conducted in Ohio, Michigan, Indiana, Minnesota, Iowa, North Dakota, South Dakota, and Wisconsin for a network hookup.

Mr. Gunn will speak to you later about a very elaborate East Coast development whose interconnection plans call for hookups for educational purposes from Canada down the East Coast as far as Virginia.

So I will end with the customary cliché which is too easy to forget. Television is only a device. Networks are only one aspect of one kind of device for television. The whole problem is to devise a feasible framework in which to operate, whether it is a little closed-circuit operation in one county, a state-wide or regional closed-circuit or open-circuit network, or a national network.

And I think one of the things to which this conference might address itself is the question of some kind of national policy framework in which to think about these things.

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Session II

WHAT HAVE WE TO DISTRIBUTE?

Mr. William G. Harley, Chairman

Session II

WHAT HAVE WE TO DISTRIBUTE?

Presentation by

Dr. Louis M. Lyons

Curator of Nieman Fellowships, Harvard University
Commentator, WGBH-TV

Educational television has reached beyond the classroom curriculum. But it has not yet reached far enough beyond. Endless dimensions of opportunity invite imagination and planning for the development of its potential.

The name "educational" suggests a limitation, and until now has probably been a limiting factor. I think of an educational television station as a noncommercial station, independent of the limitations of commercial TV, and as a community station which should reflect the activities and interests and needs of the community.

The community, as we have thought of it and tried to serve it in Boston, has been the local community, within the radius of one TV set. What we have done has been focused on such an area. We have only begun to realize the opportunity there.

Now, with the expansion of the physical reach of television through the networks we are beginning to develop, we have to think of regional programs. This adds a dimension which requires that we enlarge our view of the job and think and plan in regional terms. It is a new dimension to most of us. It presents difficulties.

Many a natural program of high local service is not suited to a regional audience. "City in Crisis," a weekly examination of the many sides of the problems of Boston, which was one of the most effective programs on WGBH last season, is not suitable for regional coverage. Nor is a series of talks with the Governor of Massachusetts about the problems of the Bay State that I have been doing—for New Hampshire and Rhode Island have different interests.

We have to rethink our programs. This calls for new planning. It requires hard thinking and the acquisition of thorough understanding of our region. We must have planning councils of people who know and represent the area, and who can and will bring new resources of planning to it.

Certain of our local programs can be expanded, adjusted or generalized to fit the region; others must be supplanted.

"City in Crisis" can become "Cities in Crisis," certainly. Transportation is usually a regional problem. The economic trends and needs of the region need examination. What, for example, is replacing our lost textiles of New England? How adequately are they filling the gap? What are the needs here to be brought to regional attention?

What should we be thinking about regionally to develop our recreation resources? to protect our rivers and coast from pollution? to suggest larger scale zoning to keep some open space between our merging blobs of urban spread?

If we find, as we well may, not very much regional planning and thinking going on, our activity will stimulate it. Indeed that must be one of our objects. We shall have to create programs and plans.

This is a large order. It takes fertile and trained minds.

It takes money. This, happily, is outside my area. The problem of adequate support for such independent station operation is, of course, our most basic one. Funds from state legislatures have been slow and reluctant. This has its plus side. It has kept our stations free of the danger of political control or pressure or the limitations that come from the consciousness of being in effect an arm of the state.

But the private support, even including that from great foundations, has so far been inadequate. Our chief limitation is our inability to pay for ambitious programs.

Although this financial problem is outside my range, I do not hesitate to say of it that it requires our sponsoring universities and institutions to be convinced that it is a true part of their educational responsibility; that it is true educational extension, indeed the most effective kind; and that they should plan for enlargement of their budgets to support educational television and radio. I say this without hesitation, even though in Boston we have been most fortunate in that the core of our support is in the generous levies our universities and institutions—notably that extraordinary institution, the Lowell Institute—have voluntarily laid upon themselves, to launch and maintain educational television.

Harvard has even two full television chairs to which it assigns each year top professors, freeing them of other duties. Boston College contributed the "City in Crisis" program I mentioned. It grew out of a very vital seminar of their own. Brandeis University contributed a seminar on American civilization under Max Lerner. Our art museum finances—and staffs—an hour a week on TV as a visit to its art treasures. Massachusetts Institute of Technology has put on a weekly hour on what's new in science. M.I.T. also provided one of our liveliest, most provocative programs —a weekly criticism of the movies.

Through Northeastern we have Eliot Norton's drama reviews and, as Norton is the leading theatre critic in the region, he can and does bring to the screen leaders in the theatre for a weekly discussion of the top plays shown in Boston. He talks about the play with the leading actor and the director or producer.

My own daily program of news and backgrounds is contributed by Harvard; it has become a part of my Harvard job. Our World Peace Foundation has sponsored weekly panels on foreign policy issues, staffed by our own faculty specialists in international affairs.

One of the most useful and practical programs we ever had, called "Facts of

Medicine," was done by Dr. David Rutstein, who occupies the chair of preventive medicine at Harvard. This was done on a grant by the John Hancock Life Insurance Company—the kind of grant for a special need that we must develop on a much larger and more consistent basis.

Two Boston newspaper neighbors, the Boston Globe and the Boston Record-American, pay the costs of our Sunday afternoon fare, which brings our area such outstanding programs as "Face the Nation," "Meet the Press," "The Last Word," and the half-hour or hour-long backgrounds programs of Howard K. Smith and Chet Huntley, and Eric Sevareid's "The Great Challenge," and in many seasons, "Omnibus." These newspapers also pay the freight for us to run the President's press conference in full each week.

All or nearly all of these programs are as valuable for regional as for local use. Indeed we furnish them to stations in New Hampshire and Albany, New York, and the Connecticut Valley, and we reach Rhode Island and most of Massachusetts direct.

The Boston Symphony concerts, of course, are as much a boon to the region as to the locality, and equally so, Prof. Wallace Woodworth's classic previews of symphony. Similarly, our programs on art, science, and medicine have universal application. So also with our weekly gardening guide, provided by the field station of the University of Massachusetts.

So also with my news and backgrounds. In fifteen minutes you have to limit yourself to the main channels of the news, and the backgrounds part is an interview with a specialist on some major news development—on Laos...Berlin...the Chinese communes...Algeria...the labor bill...the foreign aid program...the budget... or the President's message.

We already have a weekly regional news roundup by Robert Baram of the journalism department of Boston University, who is secretary of the New England Weekly Press Association.

Let me say a word about the news program. I was asked to do this when WGBH began (at first in FM radio only) because the local news programs were so utterly inadequate for the kind of audience that listens to an educational station.

I was an old pro at news. The station had a radio news wire. We soon switched to the full trunk wire of the AP, the same full news volume that goes to metropolitan papers.

This makes the core of my raw material. Beyond that I read the New York Times and the Boston Globe before breakfast, and the Christian Science Monitor at lunch, and so get the shape-up of the news. So when I turn the AP ticker on in the afternoon, I know what I am looking for. Has the Senate voted? Has there been a communique on Eisenhower and DeGaulle? What happened on the veto? Has the Security Council acted? What's Nehru's move on Tibet? To give continuity to these main threads of news development is a key chore. Of course there are new developments, any of which may top the old.

What I try to do is give an informed summary of what's going on. I have a broad definition of news. It will include Walter Lippmann's views or some editorial, or what's Time's cover story, or the lead articles in Harper's or the Atlantic, and other similar sources that go beyond the ordinary news program. I am used to the self-discipline of objective reporting and usually restrain myself to that. But I include such commentary as seems useful to explain the news, and I put in my own editorial views on issues when I am moved to.

An essential element is simply independence. This is a factor in news handling that is one of the great advantages of the educational station, and that is swiftly realized and greatly appreciated by the audience.

"Backgrounds" grew out of the news. I want to say a word about that in terms of the tremendous contribution our several faculties make to it, all unpaid and voluntary.

With several great faculties to draw on, we have extraordinarily good fortune as to backgrounds. We can have Paul Freund or Arthur Sutherland of the Harvard Law School on Supreme Court decisions; Carl Friedrich or Milton Katz on the Berlin issue; Henry Kissinger on defense policies; Stanley Hoffmann on DeGaulle; J. K. Galbraith, when he is just back from India or Poland; Walter Rostow or Max Milliken of M.I.T. on foreign aid programs; Editor Ted Weeks of the Atlantic, just back from Russia ahead of Khrushchev's visit; Clarence Haring on Latin-American events; John K. Fairbank on China; and a host more such top scholars and specialists, many of them coming and going from Washington and foreign countries. Also we might have the mayor or a legislative leader to discuss local public issues.

They are completely generous with their time and energy to come and give us in plain talk the factual background of a situation in the headlines. I do a straight interview, unrehearsed, from a series of topics that I shape up with the guest in fifteen minutes before the program. This of course is the good fortune of our local resources. But it takes close liaison by the station to cultivate acquaintance and schedule programs. Happily I have been drawing on many of these same faculty people for weekly seminar sessions with the Nieman Fellows over twenty years. Both the acquaintance and the discussion method pay off for our TV needs, and also these faculty people have learned to talk to newspapermen and to answer their questions in press conference fashion. And from their own close lecturing, they are trained to pack the fullest content into a brief period. We get over a lot of ground in fifteen minutes. We do this three days a week. I'd like to every day. But it takes a lot of somebody's time lining them up.

A major program venture of last winter grew out of these "Backgrounds" and the Nieman seminars. The station proposed a series to try to appraise the performance of the press on our major current issues. The Fund for the Republic was persuaded to put up nearly $85,000 for a series of fifteen programs, weekly, which we were able to supply to some fifty stations besides our own. These were half-hour programs—"The Press and the People" we called them. Typically each was a three-way discussion. One of my guests was a journalist who himself dealt with the story or the special area of the topic. The other was a scholar or specialist in the subject, and so almost inevitably a critic of the way the story had been handled. This proved a lively and practical exploration of the press treatment of major issues. It found audience response and received attention from the TV reviewers and many editorial writers, and it made a series of pamphlets, published and distributed by the Fund.

I am sure we could do better another time, if some sponsor with another $85,000, or even a little less, were available. This comes down again to the basic problem of all our work. Just tapes for fifty stations cost $2,500 a week, or $37,500, our accountants tell me.

We could have done these programs live for ourselves. But we taped them week ends to permit national distribution for use within the following week.

Another natural expansion of our news program has been special coverage of elections, and of the national conventions. We can get one of the three networks, and I sit up through the night and fill in on Massachusetts returns and add up the total developments. In the last November election, the Boston Globe teamed up with WGBH. I moved into the center of their election-returns bureau and broadcast with their news resources and political writers to backstop me.

We have put on special campaign programs too—weekly evening discussions, with representatives of both major parties on each panel—to discuss the way the campaign is developing, taking it up issue by issue. Also at the end of a session of Congress, we do a program with a specialist in government, to add up the results of the session. When the President or Secretary of State makes a major TV address to the nation, we follow immediately with a discussion of it with one of our political scientists.

I have dwelt on these programs with which I have personal experience. But not only because they are closest to me. They are very suggestive of what may be developed.

We have a strong core resource of regional programs in a regional capital like Boston. Some of its problems inevitably concern the whole region. Some of them reflect the condition of the whole region.

The great resource of its museums, its symphony, its great universities—with their science, medicine, law, theatre, and their specialists and custodians of the whole range of our common culture—apply as completely to the region as to the locality. So do their many forums, lectures, concerts, and conventions.

All these activities have more than local interest. All we need do is open the doors through our broadcasting system and let the whole region listen in.

This is the first step, the simple part of it—just to expand the dimensions of what is on tap. But the larger part is to explore the needs and opportunities, to go beyond the walls of our educational institutions and see what the region needs and wants and can use.

For this too we must turn to the great corps of specialists in our universities and ask them to examine the problem and come up with the answers. They are our greatest researchers, our ablest examiners and appraisers. They have the knowledge and capacity to help us fashion the regional programs that fit our situation.

We must tap this resource and apply it. This means we must have some missionaries, some eloquent persuaders, some convinced believers, to show our educational administrators the boundless opportunities outside their college gates, and to bring their knowledge and wisdom and insights to bear upon the problems of our common affairs.

This is the path—the necessary and fruitful path—to the future of region-wide service of our independent, noncommercial, community-supported educational television systems.

One of our problems is to present some entertaining programs. In the nature of things the bulk of our content is serious. We do best in entertaining children, I think. Such a program as Mary Lela Grimes's "Discovery," first produced on WGBH, later nationally, is a natural for children.

With us a real gap is sports. This is important because the commercial stations do approximately nothing but commercial major league sports. With our clusters of colleges, we should be covering their amateur sports, and we should be reporting on tennis, rowing, yacht racing, golf, swimming, for their special-interest groups. The problem is to have an informed, mature, and sophisticated treatment of sports. Broadcasters with such qualifications and interests are rare birds. We had such a man for a season. Then he was graduated and gone. This is a gap that I believe it worth some pains to fill at a first-class level.

One last word, that I trust may not be felt irrelevant.

We are compelled to put most of our energies into our television planning because it is so expensive, so elaborate, so demanding, so all-consuming of money and talent and program materials. It costs roughly ten times what radio does. But let me just turn that around and remind you that radio costs only one-tenth as much, that you can have ten times the time on radio for the same price. Radio has been in eclipse in commercial broadcasting since the more dramatic development of television.

But it is on radio that there is time to talk...a chance to tell the whole story...to finish the lecture...to give everyone his say...to explore all sides...to go into the issue in depth...to present and encourage and enjoy good talk...to forget the tyranny of the TV clock for long enough intervals to get something said...to let a person choose his own pace and discuss the thing in his own way.

Every night as I sense the approaching deadline even before I see the one-minute signal—to be followed by the half-minute signal, and then the sudden death cutoff—I yearn for the more flexible, more relaxed, more natural and infinitely greater time-span of radio.

Here, happily, we can have our cake and eat it too. For we can afford to add radio to our broadcast package. We can afford to fill in with radio where we cannot yet afford full-scale television. I would appeal for a revival of the neglected resource of radio. To me, after the inescapable pressures, strains, and limits of TV, to do a radio program is like going back to the old homestead on vacation. The rooms are larger; the chairs are deeper; the atmosphere is quiet and relaxed. It's a wonderful feeling.

Happily all my programs are simulcasts, and I enjoy those old-fashioned friends and colleagues who have never gotten a TV set and who still enjoy FM radio, when they say to me: "I don't know why I should have to watch you doing the news when I can listen a lot more comfortably, without being distracted by seeing you take your glasses off or take a drink of water."

Don't forget radio.

Session II

WHAT HAVE WE TO DISTRIBUTE?

Presentation by

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News Analyst and Consultant
Mid-West Radio and Television Corporation

The subject of this session—"What Have We to Distribute?"—seems to imply a general acceptance of the availability of *something* of significance to be distributed, leaving largely unresolved only the question of selection. But, as I read the impressive papers presented at conferences similar to this one, as I examine the burgeoning body of research data becoming available, and as I attend meetings of this kind, it becomes abundantly clear that that is not the case. There are still unresolved questions of underlying policy, and some of these, at least, we might properly explore. I do not believe that I am departing from my assignment by limiting these comments largely to principles since we can so readily apply specific programing illustrations.

Most of you will recall that vivid passage in the *Outline of History* in which H. G. Wells points out that the floor of the ocean is covered with skeletons of animals that were unable to foresee change or adjust themselves to a changing environment. Presumably they were obstinate, incompetent, unimaginative, and almost completely inflexible in their adaptation. Presumably we, on the other hand, by our very presence here and by our discussion of the possibility of interconnected state and regional educational networks are demonstrating that we are none of these things; that, on the contrary, we are not only prepared to adapt to our dynamic communications environment, but are prepared to create a new environment in order to meet the needs of our time.

The Greeks who spoke of the constant ebb and flow of affairs by arguing that one can't step into the same river twice, were corrected by a critic who reminded them that one can't even step into the *same* river once. This, I think, is a principle to which thoughtful people in the mass media pay lip service; but, in television especially, we sometimes carry it so far that we need to be reminded that all change is not progress and all movement is not forward. However, if we do indeed have "something to distribute" and if we get about the business of distributing it with reasonable efficiency, we are speaking of change which *is* progress and movement which *is* forward.

Why distribution on a network basis? It happens by sheer accident that I am now working as vigorously as possible (outside the context of the mass media) on a tentative program of regional cooperation between institutions of higher learning in a variety of fields—particularly at the graduate level. I was confident before our preliminary work began, and am *certain* now, that there are many areas in which even the most distinguished of our educational institutions have little or no business trying to operate on an independent, essentially competitive and duplicating basis. In these times of fabulously costly equipment and instruction it is quite unnecessary for, let us say, the universities of Michigan, Illinois, Wisconsin, Minnesota, and Iowa each to be developing with equal vigor every academic area, including those for which there are so few consumers that any one institution could serve them quite readily. Our own university, for example, although its enrollment approaches 30,000, is beginning to engage enthusiastically in cooperative programs with several of the institutions I've named, and I believe that programs of increased distinction are the result.

We need only look at the schedules of educational television and radio stations across the nation to see dramatic opportunities for the application of the same principle, one which applies on virtually every educational and chronological level. All of us here have in some measure experienced the economic limitations of the single corporation or educational unit.

This is quite aside from the more obvious and more widely discussed utilization of genuinely distinguished teachers who may be available in one area and not in another, and who would, through a network of the kind we are discussing, be presented to an even larger audience. That issue hardly needs attention here. But to come back to the larger point: John Schwarzwalder has pointed out, just as one small example, that the College of St.Olaf with its heritage of choral work would be able to do a presentational job in that field which could not be matched by other institutions. And I suppose the whole principle could hardly be more pungently stated than Dr. Schwarzwalder has done in pointing out that the presentation of the best available knowledge within a region to the *entire* region at comparatively low cost is the real justification of a regional network. That, however, is a theme upon which we are hearing many variations during these meetings.

There is another kind of illustration which may have some relevance: I have recently returned from more than 10,000 miles of travel inside the Soviet Union during which time I made a preliminary study of mass communication from Leningrad to Yalta and from Moscow to the frontiers of Outer Mongolia in Siberia. Since I was already interested in this linking aspect of education and mass communication, I raised questions about it with Russians wherever I went. The questions were almost always met, at the very least, with a look of incredulity. In the Soviet Union they had simply never thought of handling their system in any other way. It is quite true that their reasons are not our reasons, and their problems are not our problems by and large, but rapidly developing pressures for the establishment of live interconnected television network transmission in the Soviet Union indicates a recognition of some of the needs which bring us together here today. The development of the diffusion exchange, and simultaneous group listening projects in Soviet radio broadcasting are illustrations of a similar principle, however dissimilar the Soviet objectives may be.

As I search my unhappily inadequate memory I find that it was a relatively short time ago that there was still vigorous argument at conferences of this kind about whether we should first build educational stations and then find program material, or whether we should find valid and effective program material before considering the facilities over which such material should be transmitted. But if we develop live interconnected state and regional networks now, no such question, I think, needs to be raised. We are well beyond the point at which such argument has any real meaning. Educational television has demonstrated the availability and the producibility of valid, sound, and genuinely important materials, from which now—not next year, or five years from now, but *now*—selections can be made which would justify such network transmission.

If our central objective is not to disseminate facts, but rather to help instill the conscience of the curious man; to somehow communicate the exciting and dramatic adventure of the continuing, orderly, organized quest for knowledge; to develop not only the ability but the practice of judging and weighing, of accepting or dismissing on the basis of existing evidence—if these are our functions, then neither educational television nor educational radio may be parochial. A network is clearly indicated. Indeed, the elimination of provincialism should be one of the unique contributions of this fantastic new classroom whose rafters are the sky.

I have been concerned, however, as I have heard people at meetings of this kind speak so often of the function of educational broadcasting in terms of teaching people *how* to think rather than *what* to think. That, of course, is a neat phrase and most of us are dedicated to what we understand it to mean. But perhaps we need to be reminded that we do not learn *how* to think in an intellectual vacuum, that we cannot emphasize method out of relation to the materials with which that method deals, that genuine critical (and even perhaps creative) ability—the ability to deal with problems, the real, hard-boiled problems of a free, democratic society—develops with knowledge and understanding as well as with increased skills. Even creative imagination does not emerge full-blown and mature as did Athena from the forehead of Zeus. It depends not only upon a wealth of skills and experience, but upon a vast background of meaningfully related ideas. If we are to come to grips with the problems of our time, we must do so within a unified framework, utilizing as fully as possible a rich body of information. And here, too, the concept of the regional, or even national educational network becomes one of enormously increased importance.

I use the mass media almost every day in the field of public affairs, and I suppose that in no area is that principle so dramatically illustrated. But here an interesting phenomenon, the significance of which we are certainly not yet ready to assess, is developing—a phenomenon which educational television especially has a responsibility for changing. I mention television particularly since so often, even for the sophisticated viewer, watching public affairs programing appears to be substituted for active participation in the affairs of the free society of which we are all a part. Lazarsfeld and Merton referred to it in early studies as the "narcotizing dysfunction" of the mass media at a time when they were concerned about radio only, but there is some evidence to indicate that with the increasing time devoted—even, as I have said, on a highly sophisticated level—to viewing materials dealing with public affairs, there may be a decreasing share of energy, time, and motivation remaining for organized action. The extreme is reached with the intellectual who *is* concerned, who *is* informed, who knows what he believes should be done, but who confuses *knowing* about the problems of our time with *doing* something about them, and has been genuinely narcotized. Recognition of this danger perhaps points the way to a more important contribution of the educational network than has been so far suggested, at least in most of the literature.

If a network of the kind we envision for educational television becomes a reality, it will of course have a mass audience. But it must not become an audience of what someone has called homogenized tastes in an essentially passive and even-leveled society. If the mass media are indeed the Great Extension of almost everything, then it is up to us to look more closely and critically than our colleagues have so far done at what is being extended. I am not in the least appalled at the thought of several million additional pipelines running to a few additional central sources despite the fact that with such a network, our culture will somehow be a more cohesive one than it would otherwise be. In this instance it is the sources, not the pipeline principle which need examination; they must be responsive as well as responsible! The unwanted Siamese twin of cohesiveness need not be conformity, and surely here educational television can, and indeed must, serve a unique function.

The ancient Irish, when they immersed in a stream or river a baby at the time of his baptism, made it a rule to leave his right arm out in order that it would remain pagan for good fighting—an intriguing idea and one which we might utilize! But at the moment we need the nonpagan ideas in a right mind for good fighting too. And certainly it is here that the kind of educational network we have been discussing will make its greatest contribution.

Session II

WHAT HAVE WE TO DISTRIBUTE?

Presentation by

Dr. Clifford G. Erickson
Dean in Charge of Television Education
Chicago City Junior College

It is my obligation, I believe, to tell you something about the Chicago experiment (because it is formal instruction using an educational channel) and to try to extract a few thoughts about how this might relate to network broadcasting at a state or regional level. We are now entering the fourth year of our program which we call "TV College," a program of broadcasting formal courses for credit to the Chicagoland area. This has brought a new student body to the City College—a group of adults, average age thirty-five, highly motivated very energetic, very wonderful people to work with.

This experiment brings together three agencies (or in the first three years did bring together primarily two agencies with the support of a third)—the Chicago City Junior College, which is a part of the Chicago public schools and a part of the common school system of Illinois; WTTW, a community broadcasting agency; and the Ford Foundation, through its grant of $475,000 for a period of three years to help get this experiment launched.

We begin our fourth year this week, and the Board of Education of Chicago is determined that it will carry this program at its own expense—concerned all along, however, with the high cost of this kind of service, a question to which I will address myself a little later.

In the past three years we have prepared and offered twenty-nine different courses, twenty-six credit courses, and three not-for-credit courses. In the fall of this year we are offering ten courses for credit.

All told, we have presented 855 live telecasts with simultaneous kinescope. That makes a rather tall stack of kinescopes, does it not? Some 450 broadcasts have been presented live without simultaneous kinescope.

And with the multiplication by means of kinescopes—a daytime program ordinarily is presented live once and repeated during the same term by kine at night and vice versa, or it is repeated once again in another semester on a day-evening double series, or in the present year we are repeating in a third semester several kinescope series on a day-evening basis—all told in the first three years we have presented 3,345 telecasts.

Now, what portion of all of this broadcasting and what portion of these stacks of kinescopes would be useful for state and regional sharing? This is quite another question. We do have, however, considerable experience in this field, and we believe that there may be some portion of all of this that could be considered for sharing.

All told we have enrolled 14,000 course registrations for credit, 34,000 not for credit, and we expect that the cumulative total, with the registrations in the next several weeks, will exceed 60,000.

Now a few words about our approach.

Our approach can be summarized in a number of ways. We regard this television teaching as being different from classroom teaching. We do regard our first obligation to be to the credit student and our second obligation to be to the not-for-credit student, yet we have reason to believe that in many cases what is good credit education is also good not-for-credit education.

We believe in the team approach. A television teacher is in concert with section teachers who meet with these students on a cycle of five to nine sessions in face-to-face meetings during the term. The number of sessions varies with the subject. In Russian it's nine conversation group sessions. In the typical lecture course it might be two conferences, two mid-term quizzes, and a final examination.

We began three years ago with the team approach in preparation of these courses, but we gradually abandoned this method, so now we select a teacher—we believe we have come to the place where we can select teachers capably—and give this person the assignment of complete preparation and presentation of the course along with coordination of the section teachers who are in a supporting role.

We have production allocated to the college, direction allocated to the station, and, since our first shakedown cruise in the first month of our operation three years ago, we have a wonderful working relationship with WTTW.

We believe in substantial allotments of time to the teacher. The teacher has what amounts to two-fifths of full time in one semester for preparation of his course, and he has full time in the term of presentation for three half-hour telecasts a week, there being forty-five in number during the term.

In the preparation of a course, we now go through a rather well-worked-out sequence. We ask the teacher, first of all, to set forth carefully his objectives for the course, and by means of staff discussion we work with the objectives, helping him refine the major ones and spell out the detailed ones. After this cycle has been completed in preparation of objectives, learning materials can be selected, the outline for the course developed, and a study guide presented.

Meanwhile, he is going through an orientation program at the studio. He gets to understand what television teaching is like. He has two kinescope experiences, brief ones, and he has one thirty-minute lesson experience on closed circuit in order that he can get to know how television teaching differs from his classroom experience.

We try to avoid dated material in our telecasts. We refer to the study guide and to administrative memoranda all of the details that the student needs to know about assignments, readings, and all that sort of thing. The purpose here is that the kinescope then can be re-used in another series. Incidentally, we do reserve for the kinescope series our passion for removing dated material.

Courses we have chosen primarily include the basic courses of our college. We have a common core including English, social science, humanities, physical science and biological science. Added to the common care are a selection of elective courses which we believe are of interest and are needed in the community, and which also serve the needs of the student interested in continuing his education beyond the two years.

Now, we believe we are improving our success in selecting these elective courses, and you might be interested to know that beginning this year we no longer will choose to give two semesters of elective sequences. We are giving the first semester of an elective sequence, for example, in Spanish, and allowing the students to come to our classrooms to take second courses.

In this way we can maximize our enrollments and minimize our unit cost of operation.

Our elective courses have included courses in political science, mathematics, accounting, shorthand, psychology, astronomy, Russian, American literature, music and speech, and we have another bevy of elective courses for the fall series.

In the past three years we have graduated over a hundred students from our City College who have taken some or all of their work by television. About fourteen of these people, delightful adults, have completed their entire programs by means of television.

It is not quite true that the students do not ever have a face-to-face meeting with a teacher. As I said before, they have as few as five and as many as nine different face-to-face contacts with a section teacher.

RESULTS FOR THE FIRST THREE YEARS

Were we to pile up all our research data about five feet high, I think we could cover every square inch of these three conference tables. And all of this data can be summarized in the simple statement that these adults have earned creditable credit and there need be no question about the quality of their transcript should they choose to transfer to another college or university.

These adults are highly motivated and they are quite able. On the college ability test perhaps people will be interested to know that as a group they have higher scores than their classroom counterparts. This may be a population selection, self-selection population bias, or it may be due to the shift in the actual scores themselves which comes with maturity and with more education.

We have tried some of these "TV College" series in classroom groups where, by means of random selection or by actual election, students take these very same courses in the classroom. We find that our college-age youngsters do not enjoy this kind of instruction as well as our home viewers, our adults.

The enrollment varies with the course, and we believe that as time goes on we will become more skillful in choosing courses of great interest.

As for costs, our cost figures show that we are still averaging unit costs for credit instruction well beyond classroom instruction.

Now, let me say that we in Chicago have one of the stations with a $750,000-per-year budget that was mentioned as the top of the range this morning by an earlier speaker, and we have an installation that has equipment worth at least $1,500,000. So when we pay WTTW $18,000 per month for station charges, we must regard this fact when considering unit-cost figures.

However, we are serving a metropolitan community of some six million people, and our enrollment figures must be related to that fact.

We have tried over the three years to think of ways to reduce these costs, and I would like to cite to you a number of things that have happened which we are grateful for.

We're a municipal institution supported by tax dollars from the City of Chicago proper, and, therefore, we can serve legal residents of Chicago only on a no-tuition basis. Those who live outside of Chicago must pay a tuition.

By means of a new bit of legislation that was made into law this spring, it is now possible for the Chicago Board of Education to receive $7.60 in state aid for any Illinois resident, regardless of whether he be a Chicagoan or a person outside of Chicago.

So, in one fell swoop, we were able to advertise a reduction in tuition from some $16 per semester-hour to $9 per semester-hour for those Illinois residents outside of Chicago.

Those outside of Illinois, in Indiana and Wisconsin, still are required to pay $16.60 per hour.

We have made the very first pedestrian step in the direction of inter-institutional cooperation. The Morton Junior College, a service of the Cicero, Illinois, Board of Education, has entered into a cooperative relationship with us. They will now make it possible for any Cicero, Illinois, resident to enroll in TV College without the payment of out-of-pocket tuition. [Since the speech, the Morton Board of Education has decided to hold off on this action for the current semester.]

By means of first appearing at Morton Junior College, a resident of Cicero may receive a certificate which he brings to the Chicago City Junior College, which is a tuition remission slip. As soon as we complete our bookkeeping, we then bill the Cicero District for the full amount of tuition, and they in turn seek the state aid from Illinois.

We believe that if this kind of thing can be done in many other communities, we can, in effect, provide a television college for every cooperating community within the 90-mile or 100-mile signal area of WTTW.

Over the past three years we have also been working with the Veterans Administration, hoping that we could get them to see that this television education is worthy of support of veterans' benefits under the G.I. Bill, and at least we have the Chicago office accepting television credits now up to one-half of the veteran's program.

So we are now advertising to our veterans that they may take TV college courses provided the major part of their work or at least half of their work is in classroom instruction.

Then, too, we are aware of the fact that industry is a social agency—that is, industrial management, management in industry, is a social agency—that can provide great help in inducing people to afford themselves the opportunity for college work. Just yesterday I had a conference with one of the government agencies in Chicago, and we are setting up an arrangement whereby they, on released time, will provide a TV-viewing room for their employees to take several of our courses. We hope that by advertising this widely in the press we can get other firms to do likewise—that is, to afford improvement opportunities to their employees on a company-time basis.

I think you might have read about Professor Clark's statement at Columbia that he believes he can document the fact that industry is spending as many dollars for higher education in America as all the dollars spent for formal higher education. Perhaps by means of television and this kind of college-industry cooperation a service can be given in this manner and there can be a reduction in the over-all cost of training in industry.

Now a few thoughts about what this means logically in terms of state-wide networks.

We believe that there may be things that we have that should be shared with others, but we are concerned about the administrative arrangements that could be made to achieve this. For example, is Institution A going to provide its teachers to Institutions B, C, and D, and will Institution A thereby grant the credits to these people? Another plan would be for Institutions A, B, C, and D to prepare a course cooperatively and have it pumped into all the cooperating institutions, each of these providing the appropriate credit for its students.

As for student acceptance, we don't believe that our evidence shows any problem with adult acceptance of television instruction, but we do think that the evidence in the literature and our own evidence seem to indicate that college-age youngsters might have some difficulty or need to have more experience in order to utilize this kind of instruction.

There is the problem of residual rights. You are aware of the fact, I think, that in New York on "Sunrise Semester," teachers became part of AFTRA and entered into a contract whereby residual rights are set up for successive use of tapes or kines.

Now, in formal instruction, as contrasted with those remarks that have been made up to this time, we must regard the rights of our own profession, and we must regard also the rights of our supporting institutions. If we were to take a stack of forty-five kinescopes from Chicago and syndicate them through a state or regional network, would the Chicago Board of Education by some means receive dollars to help pay the initial costs for this stack of kinescopes? And will the teacher enjoy any residual rights for the extension of his creative work?

This is a knotty problem, and I don't think we should overlook it in our discussions.

I think too that this kind of regional-network approach to formal instruction may bring us to the place where we can bring publishers into the picture and we can get from them and from their writers the kinds of learning materials that we desperately need. One of the lacks we have discovered in three years is the unavailability of learning materials particularly adapted to television instruction. Now, if by means of a cooperative approach we can afford to say to a publisher, "We think we can deliver you X thousand students," we can then attract their talent and their resources to provide for us learning materials that are especially adapted to our purposes.

PROMOTIONAL STATEMENT ON "TV COLLEGE"

FOR DISTRIBUTION BY WTTW SPEAKERS BUREAU

The Chicago Metropolitan area is the only one in the world in which a person can tune in 49 college classroom sessions each week. All told "TV College" offers 26 credit hours in the Fall 1959 series. Most courses are offered in afternoon and evening hours.

"TV College" enrollment has averaged nearly 1,300 credit students and over 3,500 persons on a non-credit basis each semester. Since the inception of "TV College," in the fall of 1956, there have been approximately 9,000 individual registrations for credit in over 16,000 courses. When we add the non-credit viewers (those who sent in a dollar for a study guide) we find that since 1956, over 35,000 individual registrations in approximately 57,000 courses have taken place. Estimates of other viewers of "TV College" average about an additional 20,000 people per broadcast.

"TV College" students average 35 years of age, are highly motivated, and very enthusiastic. In the three years ending June, 1959, a large number of controlled experiments has shown that "TV College" students work equal to or better than classroom students of equal ability. About seven of every ten TV students who start a course remain throughout the semester and receive a final grade.

"TV College" students ordinarily come to one of the branches of the City College from three to eight times during the semester. If this number of students were to be served in a classroom college, an additional building of considerable size would have to be built, at a cost of at least $1,000,000.

One hundred ten students who have taken some work via "TV College" have graduated from the Chicago City Junior College with the Associate in Arts degree. On the average, one-half of the two years of work is taken in "TV College." Fourteen students have completed all of the work for the Associate in Arts degree via "TV College."

Unique services afforded by "TV College" are college educational opportunities to prisoners at Joliet and the Women's Reformatory at Dwight. Another group who could not be served by any other means are handicapped and hospitalized students, including veterans in the veterans' hospitals. Each semester almost one hundred students are included in the latter categories. Professional proctors administer examinations where the student is located. All examinations, grading, and course grades are awarded by the Chicago City Junior College staff.

New courses for Spring 1960 include the following: Biology 102, Pitman Shorthand, Introduction to Personnel Work in Industry, Advanced English Composition, American Literature--Civil War to Present Day, Humanities 201, College Algebra, National Government, Problems in Human Relations, and Elementary Spanish.

Residents of Chicago may attend "TV College" tuition free; each TV student pays only a $5 service fee for eight or fewer semester hours--$10 for nine or more. Residents of Illinois, living outside of Chicago, pay $9 per credit hour; residents of outlying states pay $16.60 per credit hour.

Session II

WHAT HAVE WE TO DISTRIBUTE?

Presentation by

Mr. Ralph Steetle

Executive Director
Joint Council on Educational Television

As Mr. Hull said earlier, a radio or television station is a neutral facility until it transmits a program. And programs, as we know, are made by people. Then one answer to that question—"What do we have to distribute by networks?"—is the ideas of men and women in American education.

Educational television in 1959, for example, means not only the forty-four noncommercial educational television stations but hundreds of educational broadcasts over commercial facilities and networks and more than two hundred closed-circuit systems for educational purposes.

The competence and quality of the people involved in the great continuing experiment in using the mass media for the service of the individual, together with the constantly increasing need for better education for more people, argue, I think, for the feasibility of networking.

Who are the people who would be involved?

First I think comes the teacher. I have been impressed, as all of you must have been, by the hundreds of schoolteachers and faculty members who have taught with real ability by television, both formally and informally. You will note the large number of people who took those Chicago courses not for credit.

Those who thought in the early days of educational television that only the teachers with a bit of "ham" in their personalities could be effective TV instructors have learned that television interposes no barrier to the communicating ability of the teacher with knowledge of his subject and normal skills in passing it on to a student.

It takes courage to leave the protective privacy of the classroom to teach publicly by an unaccustomed medium. Teachers these past six years have taught unflinchingly to the red-eyed camera, have withstood the distractions of the studio's orderly chaos, and have worked with the practitioners of production to visualize their lessons. They have even dared, and I think this is extremely brave, to share the goals of their courses with research personnel so that both television and their own skills could be evaluated.

The administrators of education—boards of education, university regents, presidents, deans, school superintendents, curriculum staffs—have all contributed their thoughtful assistance to the development of educational broadcasting. The educational pioneering that administrators have enthusiastically made possible casts real doubt, I think, on the accuracy of the charge that fifty years is required for the incubation of a new idea in education.

The interest and skills of research personnel challenged by the unknowns of educational television have given us the ringing phrase "no significant difference." But when skills in the use of television finally break through the barrier of "no significant difference," the researchers will be available to provide foundations of fact for the next steps forward.

Here is the growing experience of an important group of men and women to help us answer the question, What do we have to distribute?

Not the least of the ideas available for distribution are those of the growing number of educational television producers...directors...floor men, with skills equal to and many times surpassing their commercial colleagues, but with a knowledge of and a sensitivity to the special problems of the educational substance they process for distribution.

And the professional workshops of the NAEB provide continuing stimulus to continued growth in competence.

The national educational organizations, many of whom cooperated in the formation of the Joint Council on Educational Television, have gained a high level of sophistication in educational communications. They examine ETV in the light of educational needs, and their continued involvement gives educational status to what we have to distribute.

The National Educational Television and Radio Center is a resource for continued emphasis on the more informal meeting of educational needs.

The givers of funds, corporate and philanthropic, provide assurance of access to risk capital for creative experimentation. And sometimes—this may be heresy—their catalytic and healthily controversial ideas are as helpful as their money.

And, finally, I think we are given a mandate to distribute that which we believe to be educational in the deepest sense of the word—by our faith in the strength of the educated individual in our democracy and his increasing demand for knowledge.

Session II

WHAT HAVE WE TO DISTRIBUTE?

Discussion Following Formal Presentations

MR. HARLEY: Dr. Ziebarth, I'm very much interested in your discussion of the narcotic effect of educational broadcasting, and I would be interested in your expanding further—perhaps ideas on how we might avoid producing this effect.

DR. ZIEBARTH: When I mentioned the narcotizing dysfunction, I suggested that many of you would be familiar with the Lazarsfeld and Merton work on this issue. Preceding the advent of television they pointed out that studies were already showing an increasing proportion of time being devoted to the mass media and that the outpourings of these media presumably enabled us to "keep abreast of the world." Yet they believed it possible that this enormous and ever-increasing supply of material in the public affairs area might well elicit only a superficial concern with the problems underlying the information presented, and that such superficiality frequently covers a kind of mass apathy. This is what they meant, I believe, by the use of the term "dysfunction"—a situation in which a listener was narcotized rather than energized. It has, however, another and much simpler dimension, too; that is, as an increasing amount of time is devoted to the mass media, a decreasing amount is available for organized action.

When I suggested that educational television might in some cases serve this narcotizing dysfunction I was thinking of it on both these levels. Especially, however, I had in mind the extent to which educational television may contribute to the confusion between *knowing* about a problem and *doing* something about it—the substitution of a kind of intellectually active but socially passive pattern of response which may be undesirable. Educational television certainly contributes background information and knowledge of enormous importance to the fairly highly selected groups numbered among its consumers. On the other hand it may fail, for the reasons I have mentioned, to stimulate the kind of organized social action which in a democracy most of us would agree should occur among these very people. I am not sure how Lazarsfeld and Merton would feel about my applying their principle to the new medium, but if it has validity I think that we ought to be reminded of it, and indeed we ought to attempt to act upon it. It does not seem a complex or difficult task to at least examine our programing with the problem in mind.

Several of you have asked about Soviet practices in this respect, and I might make two quick and, I hope, relevant comments. First, Soviet electronic media make quite clear the kind of social action which is expected. Secondly, since the pattern of possible social action is so limited, and since the Soviet citizen characteristically appears to regard his responsibility in quite a different way from that of the American citizen, the factor is virtually inapplicable. I might just add that I should expect every Russian viewer or listener to be narcotized in the real and obvious sense by the simple duration and dullness of the majority of the programs. In this respect at least we have a substantial advantage.

THE VERY REVEREND CELESTIN J. STEINER, S.J.: May I ask a very simple question about exploring a little farther your distinction between the television instrument serving the purpose of telling people *how* to think and *what* to think? That interests me, for maybe obvious reasons, a great deal—content versus method, or in other words, the philosophical viewpoint.

DR. ZIEBARTH: The question may be, as you suggest, a simple one, but the answer is exceedingly complex. I did not mean to suggest that in my opinion the educational broadcaster has a responsibility for telling people what to think. It was my purpose rather to suggest that we should not rationalize our failure to provide materials on the basis of which genuinely rational decisions about what to think may be made. Since I have been unable to attend NAEB and similar meetings regularly over the past few years, I have been attempting to keep in touch by reading the proceedings of all such published conferences, and I find that occasionally someone will suggest, as if the idea is somehow new and startling, that no broadcaster has the responsibility nor indeed the right to try to direct the thinking of his viewers or listeners. There is in that quite obviously a good deal of validity. But it does not at the same time eliminate, I think, the responsibility of the broadcaster for the presentation of those rather basic materials from which mature, responsible, and competent judgments will grow. It is only when these materials are interwoven in a meaningful way that such judgments do emerge, and it would seem to me to be an elementary part of our job to keep in mind the need for the presentation of materials at that level.

FATHER STEINER: I agree that we can't think in a vacuum. I think we must avoid telling people *what* to think, but still we need to give them convictions.

DR. ZIEBARTH: What is needed perhaps is to provide materials upon the basis of which these convictions may rest firmly and securely. I should hate to appear to suggest that value-judgments should run through our programming in such a way that we become a kind of electronic editorial page, and yet I do believe that the catch phrase is all too often used by us as a rationalization for not doing a genuinely mature and responsible job in this respect.

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Mr. Robert Schenkkan, Chairman

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Seymour Krieger

Legal Counsel
Joint Council on Educational Television
and
Greater Washington Educational Television Association

In the absence of Mr. A. Earl Cullum, Jr., for whom I am pinch-hitting, I'll do the best I can to describe the proposal of the Southern Regional Education Board as it was presented to the Federal Communications Commission just about two years ago. The occasion of that presentation was the Commission's proceeding on the allocation of frequencies above 890 megacycles—that is, in the microwave portion of the spectrum.

The eligibility of persons and companies and educational institutions to establish their own microwave facilities has been in a rather indefinite state so far as the FCC rules are concerned. The Commission decided to hold an over-all allocation proceeding so that they could establish some policy on the allocation of microwave frequencies for private use, as distinguished from common-carrier use.

The proceeding involved perhaps more than a hundred parties, and it lasted over a course of six or eight months, during which time all of the applicants for these frequencies came forward and stated their claims. These involved the oil companies, industrial users of all kinds, and, of course, the educational users—the SREB and the JCET both making formal presentations to the Commission.

The big issue before the FCC was whether or not there are sufficient frequencies available in the microwave portion of the spectrum so that individual users could establish their own private systems or whether, because of a scarcity of channels, it would be required to allocate them primarily for common-carrier use and then have the common carriers set up the systems and serve the various customers.

At the presentation made in the summer of 1957, Dr. Robert Anderson of the SREB and Earl Cullum, as consultant, were the two witnesses for the SREB, and they presented to the Commission their plan for this live network. To say the least, the plan is a very ambitious one. I shall try to describe it as simply as I can.

It involves a live television network. Essentially it is a large closed-circuit system, because it was not intended primarily for broadcast purposes. It was intended for the transmission of educational material, generally college course instruction material, among the 309 institutions of higher education throughout the 16-state region that comprises the Southern Board's area. This is from Texas through Oklahoma, up to and including Maryland, and the entire southeastern portion of the United States.

This system contemplated the creation of six television channels which could be used simultaneously. Five of these channels were for use, and the sixth channel was a standy-by for emergency use in case of breakdowns, so that each institution that was connected to this system would be capable of receiving five different programs at any given point of time.

It was contemplated that the system would be in operation about six hours a day and six days a week, Mondays through Saturdays. The material that would be transmitted over it would be received at these 309 educational institutions and used as a basic and integral part of the course of instruction at the institution.

The system included more than 10,000 miles of circuits. It was contemplated that there would be at the outset 32 origination points throughout the entire southern region. This meant that these course materials could be originated at any one of 32 separate centers and transmitted simultaneously on this live network to all of the 309 colleges.

In the presentation that was made by Mr. Cullum he stated that there would be required 500 megacycles of spectrum space in the range between 3,000 megacycles and about 6,500 megacycles. This generally is in the area where AT&T's transcontinental network operates. And Mr. Cullum's presentation envisaged a system comparable in all respects, both in terms of quality and dependability, to the present AT&T transcontinental network.

The cost figures were quite important in this presentation. The total cost of the network, the total cost of construction, was something over 200 million dollars. The operating cost of the technical facilities was on the order of about 7 million dollars a year. And then, of course, in addition to that, there would be required the costs involved in putting together the programs and, in effect, the program portion, which could well amount to another 12 to 14 million dollars a year.

As you can see, this is a rather ambitious project.

By way of comparison, we attempted to get some figures from AT&T as to what their costs would be for this kind of service. We wrote them several letters, and we never did get a firm figure from them. But Mr. Cullum took their tariffs that are on file with the Commission and studied them carefully, and it was his opinion that the cost to the AT&T for this network service would be 42 million dollars per year.

Now, that is the cost that compares with the 7-million-dollar figure for the technical operation of these facilities.

When you consider these costs, of course, you must also consider the consumers of this service. At the present time there are about 600,000 students in the 309 institutions in the 16-state area that would receive this educational service, and it is contemplated that within about five or six years this number might well rise to about 700,000 or 800,000 students.

So when you divide the cost by the number of students, and perhaps even better by the number of credit courses that are being taken, you find that the cost per credit course comes down to something like $2.40. This compares quite favorably with the costs that are now involved in teaching on campus, which is in the order of $15 to $20 per credit course.

Just about a month ago the Commission issued its report and order in this microwave proceeding. Educational interests won one side of the battle and, at least for the time being, apparently have lost the other.

The Commission decided that there did appear to be sufficient frequencies above 890 megacycles to authorize private users, and the Commission's policy will be to authorize commercial companies, oil companies, and educational institutions to construct and use their own private systems. They do not have to go to the common carriers for this service.

But when the Commission came to decide what frequencies would be available for this service, unfortunately they relegated the educational applicants to the frequency range of above 12,000 megacycles.

Now, this was in the face of evidence that we presented to the Commission that these long-range systems would require frequencies below 7,000 megacycles.

Just yesterday the SREB filed with the Commission a joint petition with the JCET requesting that the Commission reconsider that portion of its decision so that frequencies would be made available below 7,000 megacycles for these long-haul live networks, because, as we stated in our document, the evidence is perfectly clear that you cannot have a transcontinental system, or even a system of more than two or three hundred miles, in the area above 12,000 megacycles.

And this is entirely aside from the question of availability of equipment, because the propagation characteristics of the spectrum above 10,000 megacycles is such that, because of rainfall and other atmospheric conditions, you have such signal loss that there is no equipment available that can bring back the picture after six or seven hops or something of that kind.

These frequencies above 12,000 megacycles are fine for short-haul work, for circuits within a city or perhaps circuits going only fifty to a hundred miles. But beyond that distance these frequencies are not usable for such networking.

That's about where the proposal of the SREB stands at this time, and, of course, we're hoping that the Commission will reconsider this question of frequency allocations and make available for our use frequencies in the portion of the band that will permit feasible and economic network operation.

Mr. SCHENKKAN: I'd like to add one little note to that: That this magnificent project has had a small offspring. We are shortly in central Texas to start on the first phase of a microwave network involving a mere twelve institutions with four originating points and only one microwave circuit but reversible so the signal can go either way. This is under the auspices of a contract which is in the final stages of negotiation with HEW. This we hope will be a demonstration of the feasibility of this interchange problem.

This is a little off the engineering side, but one of the big problems that the SRED project has run into, of course, has been administrative, and we hope to get some clarification in this area before we get going on a bigger project.

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Al Renfro

Chief Engineer
Alabama Educational Television Commission

Are networks technically feasible for television program interchange using microwave? This question can be answered in the affirmative by citing the following operations.

The American Telephone and Telegraph Company and Bell Telephone operate a very extensive network designed to handle both network audio and picture information. The very existence of the major radio and television networks depends on the fact that networks are technically feasible.

Other examples of operations depending on the network method of signal distribution for their successful operation are: many community antenna distribution systems, an extensive microwave system serving the television stations on the island of Cuba, the State of North Carolina television network, and the largest network operated by an educational television system in the United States today — the Alabama Educational Television Network.

In Alabama three VHF television transmitters are linked in an educational television network. These three transmitters are fed programs from three programing studios located at widely separated points in the state. During the previous school year this network was programed from nine in the morning until ten at night, five days a week. This amounted to 65 hours a week. All three transmitters are programed simultaneously as a network. Each studio contributes approximately one-third of the programing necessary. The studios usually program on a rotating basis from half-hour to half-hour.

The microwave network necessary to interconnect this system of studios and transmitters consists of twelve microwave hops and one off-the-air pickup receiver. This network extends over a total of 402 route miles.

The shortest microwave hop in the network is just slightly over 1 mile in length and the longest is 44 miles between repeaters. The off-the-air receiver is located 77 miles south of Channel 7 atop Mount Cheaha. This receiver then feeds a two-hop microwave leg providing program service to Channel 2 located just north of Andalusia, Alabama.

With the exception of the Channel 2 transmitter, the remaining two VHF transmitters, if necessary, can be programed separately by the microwave system.

The microwave system layout as it now exists is as follows: starting with the studio on the campus of the Alabama Polytechnic Institute, a microwave transmitter in the studio building feeds a 6' horizontally mounted parabolic antenna mounted near the ground. A 10' x 14' mesh reflector mounted on top of a 200' guyed tower changes the vertical beam to a horizontal beam and directs it to the first repeater located at Doss Mountain, a distance of 30 miles. The Doss Mountain repeater consists of a microwave receiver and a transmitter. The Doss Mountain receiving antenna is a 6' parabolic dish mounted on an A-frame on top of the repeater building. The transmitter antenna is a 10' parabola which is also mounted atop the building. The next repeater location is Mt. Cheaha, the Channel 7 transmitter location. This location is the highest point in the State of Alabama and is 2,407 feet above sea level. The length of the Doss Mountain to Mt. Cheaha path is 44 miles, the longest hop in our system. The output of this receiver is looped through several distribution amplifiers which feed an input on the line selector switcher feeding the Channel 7 transmitter, a monitoring circuit, and the input to another microwave transmitter. This receiving antenna is a 10' parabola and the transmitting antenna is a 6' parabola, both building-mounted. The Mt. Cheaha microwave transmitter feeds a signal 39 miles to the next repeater, located near Branchville, Alabama, on top of Bald Rock Mountain. The Bald Rock receiver is patched to the transmitter input and this transmitter feeds a 6' parabola, both of which are building-mounted. The next receiver is the terminal of this feed that originated in Auburn and is 22.5 miles away in Birmingham at the Channel 10 transmitter. The receiving antenna on the Birmingham end is a 6' parabola. The video output of this receiver is looped through several distribution amplifiers for program and monitor feeds, then terminated.

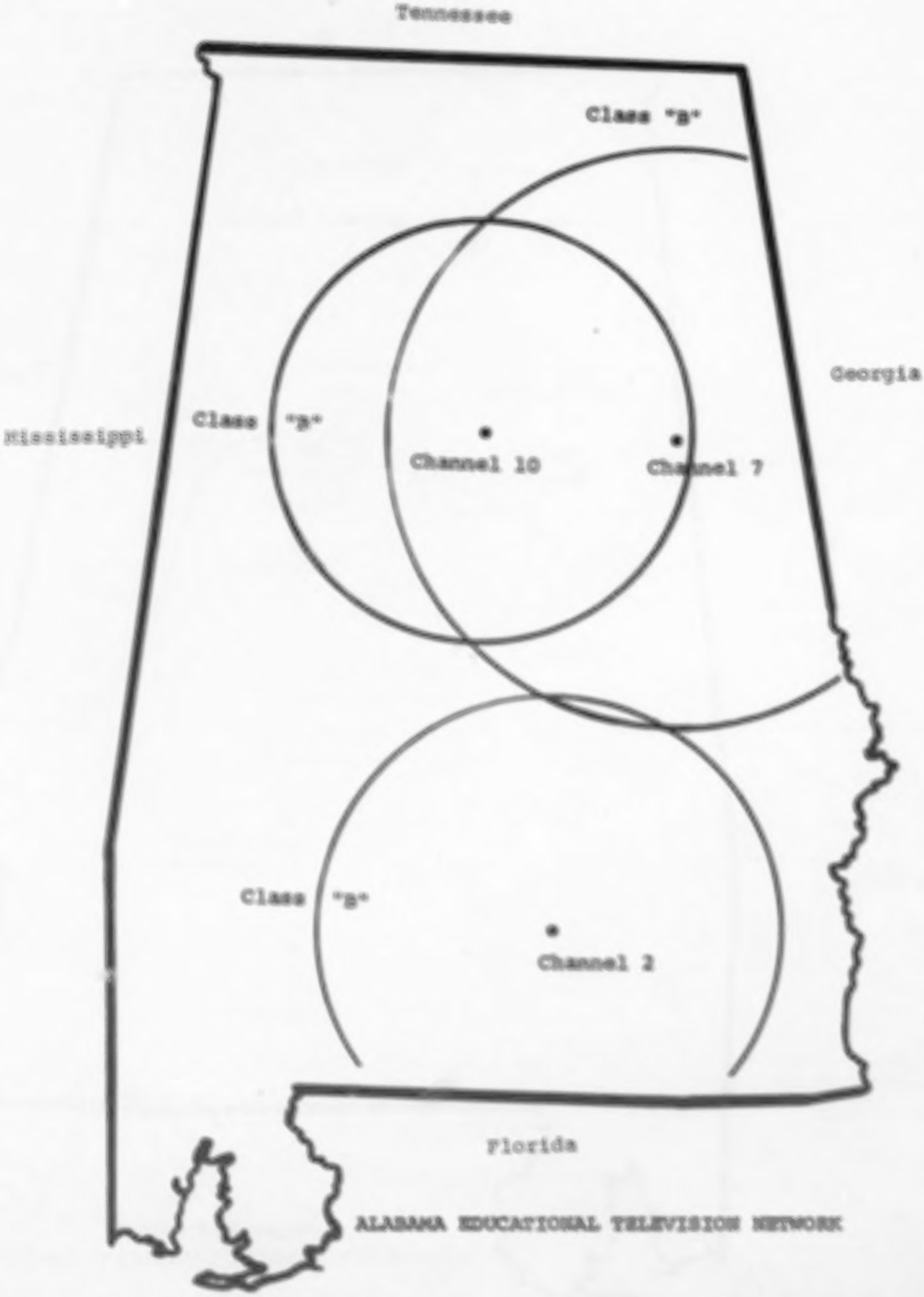
The program feed from the University of Alabama studios in Tuscaloosa is similar to the previously described system. The transmitter at the university feeds a 6' horizontally mounted parabola, and a 10' by 14' passive reflector on top of a 200' guyed tower directs the signal to a repeater at Antioch. A 200' tower at Antioch has two 10' by 14' reflectors mounted on top, one for receiving from the university 17 miles away, the other for transmitting to Birmingham 22.2 miles away. The termination for this circuit is at the Channel 10 transmitter.

The Birmingham Area Studio feeds a transmitter with a building-mounted 6' dish. The termination for this feed is also at Channel 10.

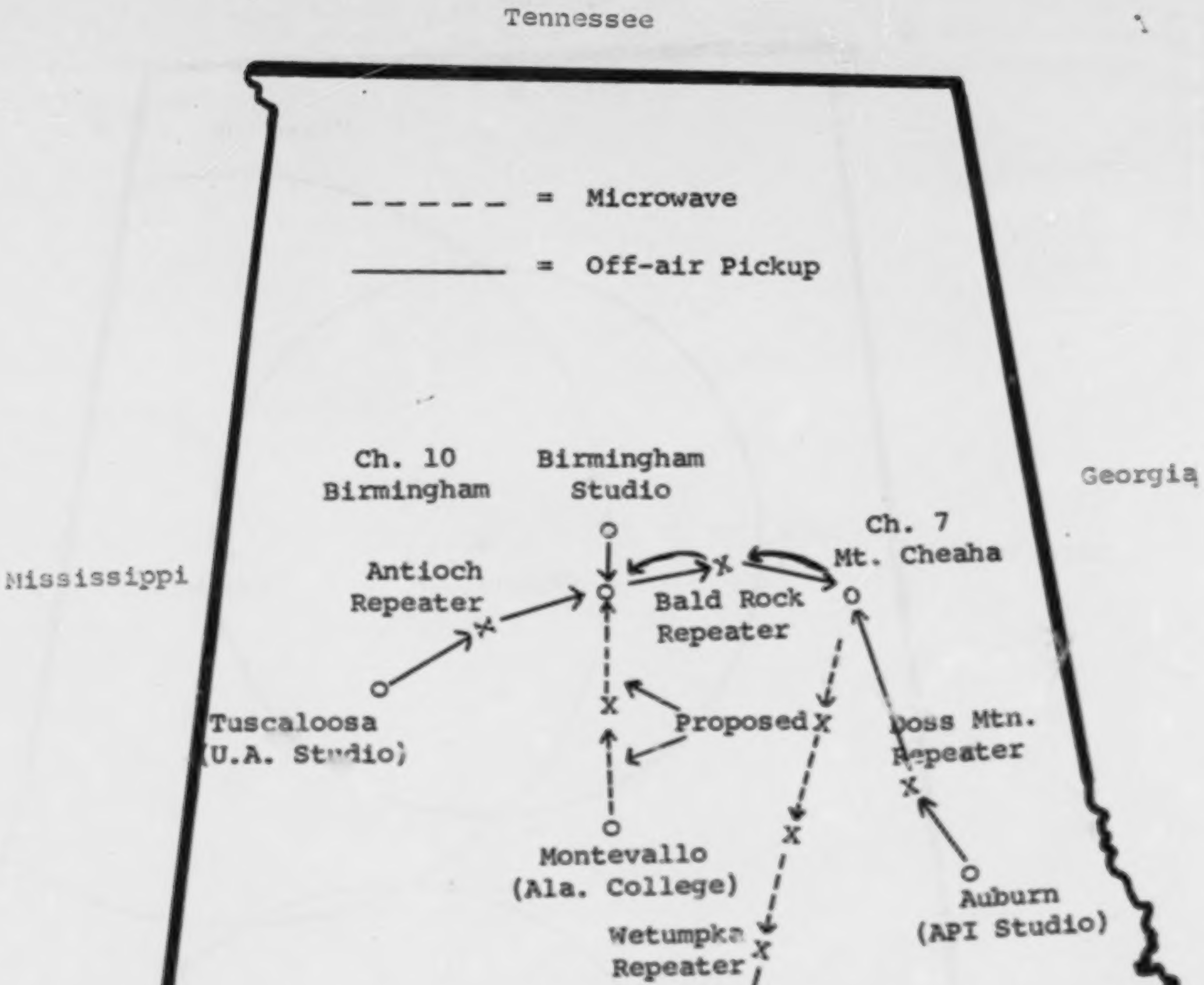
With a routing such as has been described, Channel 10 becomes a control and master switching center. All remote feeds and any local originations, such as film or test signals, are fed to a switcher, then to a stabilizing amplifier. The output of the stabilizing amplifier is normally patched to the Channel 10 transmitter and to the input of a microwave transmitter, feeding a circuit which provides a feed to Channel 7 of the university, Birmingham, and film or test signals. This link parallels the Mt. Cheaha to Birmingham circuit and uses the same repeater building with dishes mounted on top of each roof. Thus we have a complete two-way microwave simultaneous system between Birmingham and Mt. Cheaha.

Channel 2 is fed a network system by picking up 77 miles south of Mt. Cheaha the Channel 7 signal, and microwaving the signal to Channel 2 through two hops. These hops are 37 and 32 miles each. Antennas used are 6' parabolas.

At each television transmitter the video is fed through a stabilizing amplifier and then to a television transmitter and at Channel 10 to a microwave transmitter.


Tennessee
Class "B"
Georgia
Mississippi
Class "B"
Channel 10
Channel 7
Class "B"
Channel 2
Florida

ALABAMA EDUCATIONAL TELEVISION NETWORK


Tennessee
Mississippi
Georgia
Florida
- - - - - = Microwave
———— = Off-air Pickup
Ch. 10 Birmingham
Birmingham Studio
Antioch Repeater
Bald Rock Repeater
Ch. 7 Mt. Cheaha
Tuscaloosa (U.A. Studio)
Proposed
Doss Mtn. Repeater
Montevallo (Ala. College)
Auburn (API Studio)
Wetumpka Repeater
Mt. Carmel Repeater
Ch. 2 Andalusia

MICROWAVE ROUTES
ALABAMA EDUCATIONAL TELEVISION COMMISSION

The sound for the television program is carried on the microwave by multiplexing an FM modulated subcarrier on the video modulation. All microwave equipment in use by the Alabama Educational Television Network operates in the 2,000 mc band, and uses a total of four channels in this band.

With the exception of the half-watt transmitter used between the Birmingham studio and Channel 10, all microwave transmitters are rated at 10 watts output.

On all individual hops we have a fade margin in excess of 25 db over the 26 db signal-to-noise ratio we consider as a minimum useful picture. The total propagation reliability is over 99.95 per cent on the entire system. Video amplitude vs. frequency response is within 1.5 db from 30 cycles to 4.8 mc. Video linearity is within 5 per cent, under normal conditions.

Audio frequency response is within 1.5 db from 40 cycles to 12,000 cycles. Audio distortion is under 2 per cent over-all and noise averages a -52 db over-all.

With the exception of the feed to Channel 2 involving an off-the-air pickup, all performance measurements are made in Birmingham at Channel 10. This is accomplished by feeding a test signal from each studio and measuring the result in Birmingham. In the case of the Birmingham to Mt. Cheaha feed, this circuit is patched back into the Mt. Cheaha to Birmingham circuit and the over-all system can then be measured.

To successfully plan and engineer a microwave system, either one hop or an extensive multihop layout, many factors must be carefully considered. I will attempt to outline the major factors to be considered in the preliminary design of a system.

It is popularly assumed that microwave energy travels from transmitter antenna to receiver antenna in a "beam" similar to the beam of a searchlight. In practice, the conditions that exist are somewhat more complicated. The energy received at the receiving antenna is affected by:

1. The earth being close to the beam diffuses and scatters a part of the transmitted energy and may reduce the signal received, even if line-of-sight exists between the two antennas.

2. Variations of density of the atmosphere, which could cause the path taken by the beam to bend, and under some circumstances will cause the signal to fade.

3. Objects in the path which will cause the signal to diffract.

4. The density of foliage, which will vary with the seasons, causing absorbition.

5. Open water, which will cause varying degrees of reflections.

For a successful microwave system, it is necessary to plan the microwave network so that on each individual hop or path the above effects will be kept to a minimum.

To minimize the signal loss caused by absorption of the earth, more than line-of-sight clearance is necessary. A large part of the energy arriving at the receiver antenna will travel in other than a straight line. Most of the useful energy is contained in a region called the Fresnel Zone. This region should be free of all obstructions. The Fresnel Zone is contained within a boundary extending from the transmitter antenna to the receiver antenna. This zone is defined as the boundary which any reflected signal would travel an additional half-wavelength in going from the transmitter to the receiver. Because there exists a 180-degree phase shift upon reflection, any signal arriving at the receiver by this path will be an aiding signal. Any reflection from a surface within this boundary will not have the added half-wavelength of travel and will cancel either partially or totally the energy arriving at the receiver. In practice it has been found desirable to provide greater clearance for longer paths, while smaller clearance may be used for the shorter ones.

Energy from the transmitting antenna would travel in a straight line if the atmosphere were perfectly homogenous. Variations in the dielectric constant of the air can cause the path of the energy to be refracted or bent.

Nearly all paths are subject to some fading caused by atmospheric conditions. It is customary to make an allowance for fading when planning a microwave system. A standard fading allowance can be used in most parts of the country with good accuracy. In a few conditions where a path is subject to periods of humid stagnant air and where wind velocities are very low, severe fades can be expected. The presence of ground fog is usually an indication of fading conditions. In these cases, a special engineering study of the proposed path should be conducted.

Assuming a line-of-sight propagation with adequate Fresnel Zone clearance, the distance between stations in a microwave system is determined by frequency of operation, transmitter power, receiver sensitivity, and available antenna gain necessary to overcome propagation losses between stations. In the case of 2000 mc the free space attenuation is approximately 11 db less than at 7,000 mc. The loss can be obtained by using the formula: Loss (db) = 103 + 20 Log D (mi.) while at 7,000 mc the formula is Loss (db) = 113.9 + 20 Log D (mi.).

At these frequencies antenna systems with unusually high power gains are both practical and economical. Using transmitters with readily available powers, it becomes an easy matter to overcome propagation losses as high as 150 db in some cases and still provide a recommended 30 db fade margin for the receiver. The minimum useful carrier level for most 2,000 mc microwave television receivers is -95 dbw. This carrier level will provide an output peak-to-peak video signal-to-RMS noise ratio of 26 db. A 26 db signal-to-noise ratio will provide a commercially useful, although somewhat snowy picture in a high-quality monitor. Carrier levels greater than -95 dbw. at the receiver input will provide correspondingly better signal-to-noise ratio.

At this point, it should be recognized that the simplified procedure outlined here applies only to a system design which involves no unusual problems. Every effort should normally be made to achieve the full Fresnel clearance over all obstructions along a proposed microwave path. Unusual path problems may sometimes be encountered in which diffraction losses due to inadequate Fresnel clearance may actually be less than the transmission line losses or dish-to-reflector space losses incurred at the terminals if the practice of providing Fresnel Zone clearance is applied rigidly. There are no simple rules which can be applied in all cases. The designer must rely on his judgment to find the best solution to a special problem.

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Howard Town

Technical Supervisor
National Educational Television and Radio Center

This afternoon I'd like to tell you a little about our plans for a national videotape network operation and at the same time tell you something of the work done to date by the National Educational Television and Radio Center in providing the necessary technical facilities, training, and the organization required to inaugurate such a service.

Through a grant provided by the Ford Foundation, the NETRC has purchased a considerable number of videotape recorders to be used in recording and broadcasting NET programs over affiliated educational television stations.

Several major improvements will be forthcoming to on-air National Educational Television. Primarily they are:

1. Quality. The storage of video information on magnetic tape provides, when played back, a nearly 100 per cent live broadcast quality and at the same time provides superior audio quality, as compared with 16-millimeter optical sound tracks. Therefore, recorded educational programs will equal the quality of recorded commercial programs.

2. Flexibility. Videotape will allow stations to easily adjust their schedules to use special talent available only at certain hours. It will further open new sources for program material, such as around-the-nation news program segments composited into one full-length program, also special events from outdoor locations, and possibly in the not-too-distant future, it will open new areas world-wide.

By the use of videotape it is normal practice to record and review the recording work within seconds and thereby check and make any corrections required to the program immediately.

Finally, flexibility between the Center and the affiliated stations is improved, as programs can be interchanged much more rapidly without the usual laboratory processing delays.

3. Economy. Videotape will allow more effective use of station personnel and more efficient use of studio equipment and facilities. Due to the flexibility features afforded by the use of videotape, considerable time can be saved, adding to the economy.

A committee of engineers selected from educational stations was appointed by the president of the Center to evaluate and determine the equipment required for station and tape network operation. It was recommended to the president of the Center by the committee, after a complete study of available recording equipment, that videotape recorders be purchased from the Ampex Corporation at Redwood City, California.

The Center's Tape Engineering Committee further recommended that a list of required test equipment be purchased at each educational station awarded videotape recording equipment. In addition, the committee recommended to the Center that the affiliated stations be required to comply with the Society of Motion Picture and Television Engineers' recommended practices.

The Center's Tape Engineering Committee met at a later date in Redwood City, California, to establish videotape technical requirements to be met by producers of videotape programs. As a result of this meeting, technical requirements have been established which are in accordance with the proposed Society of Motion Picture and Television Engineers' recommended practices, the Electronic Industries Association's electrical performance standards for monochrome studio facilities, and the Federal Communications Commission's rules and regulations for broadcast services.

The technical requirements should provide complete interchangeability for videotape network operation, uniform audio and video recording quality, and technically acceptable programing for broadcasting over all NET-affiliated stations.

Further, the committee approved the National Educational Television and Radio Center technical training program to be provided by the Ampex Corporation for station engineers. The training program will cover system theory, detailed circuitry, and general operations and maintenance, including practical training. The training program is one full week, or forty-six to forty-eight hours of intense classroom work. Also included are the Center's technical requirements.

Without a clear knowledge of the problems in the operational setup of videotape and equipment, it is not possible to properly duplicate or intersplice videotapes from different sources. It will be necessary that all recording engineers learn the key to interchangeability through the understanding and use of a standard video alignment tape. The engineer must become thoroughly familiar with the Center's technical requirements in order that we might prevent the inadvertent and unintentional dilution of free interchangeability of videotape recordings.

To insure videotape interchangeability, the Ampex Corporation is providing a standard reference alignment tape to be used in the adjustment of equipment. The tapes will be precisely uniform and will be checked against a single standard prior to release to the affiliated stations.

Certain electrical tests are required on the head of every videotape recording for the purpose of evaluation and setup of the play-back equipment. It is essential that each station be properly equipped with uniform test equipment in order to establish standard adjustment and measurement techniques, thereby minimizing confusion in the evaluation and interpretation of electrical measurements.

Ampex and the Center, through the training program and subsequent technical bulletins, will provide all recording engineers up-to-date information regarding standard operation and alignment procedures.

In addition to the forty-three tape recorders provided to the affiliated stations, five additional recording units and the associated accessories and interconnecting equipment will be installed at the Center facilities at Ann Arbor, Michigan. The equipment will serve as a system for duplication or mass production of copies of videotape programs for network distribution. The programs will come from outside sources as well as affiliated education stations.

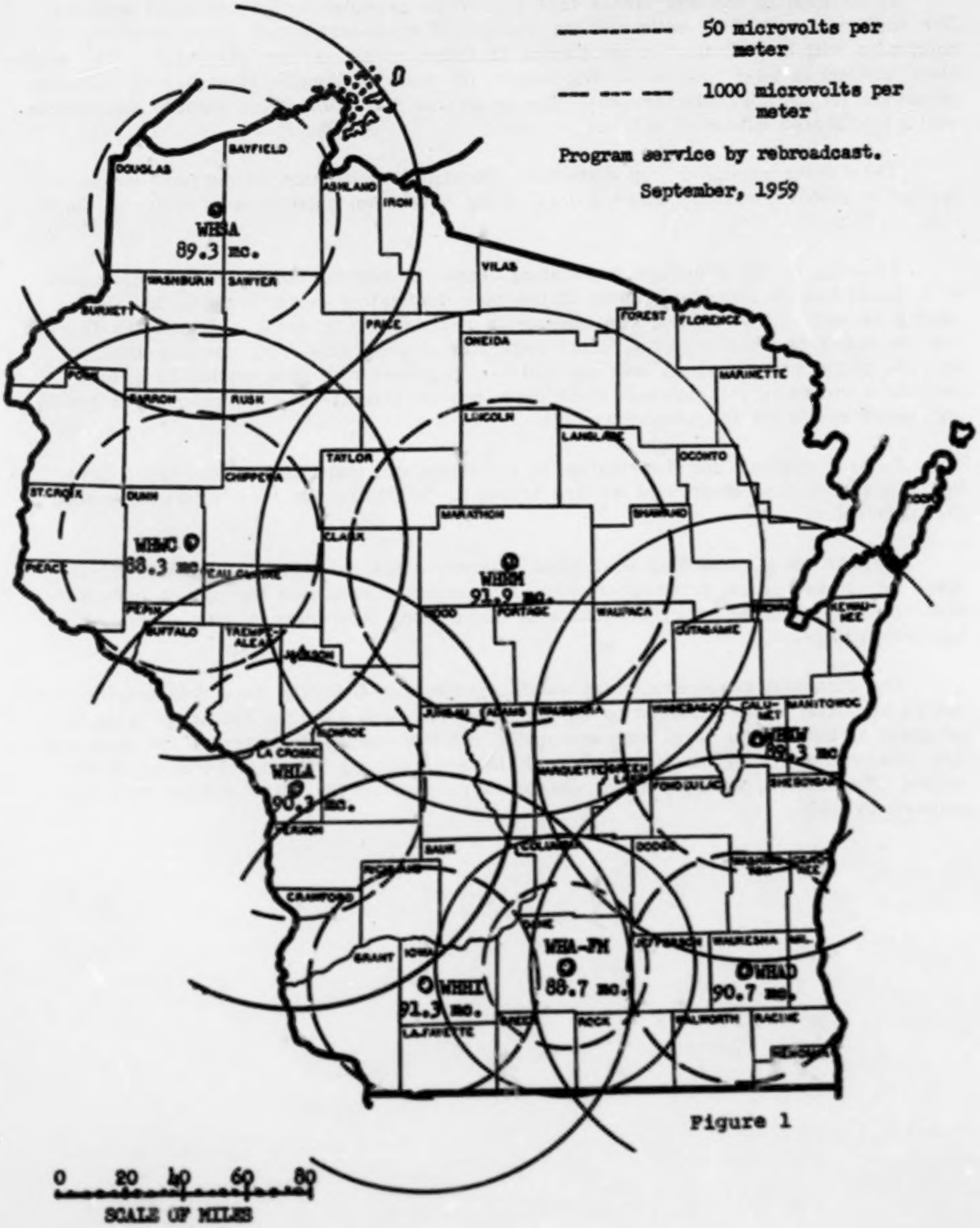
The Center hereafter can distribute educational programs on current events or special one-shot programs which before would have been prohibitively costly to duplicate on film.

Planning of the videotape duplicating center is nearing completion at this time. It is hoped that in the development of the tape duplicating center we can do minor editing as well. The system can operate in reverse, so to speak. I mean by this that we might be able to switch short segments of programs from several different sources and composite them into one full-length program. This would, in effect, provide a means of intermixing, much as a remote around-the-NET program might do, and would constitute the electronic edit.

Several systems for distribution of the tapes and inspection of the tapes have been suggested, and at present we are trying to determine the most efficient method for distribution.

With identical recording equipment in every affiliated station, standard adjustment and measurement procedures, and uniform instrumentation throughout the affiliated stations, we have every advantage of maintaining interchangeability among videotape recordings.

The technical requirements as established by the Center's Tape Engineering Committee are soon to be released to the affiliated stations. With a videotape training program already under way, with equipment currently being delivered to the first fourteen stations, and with the cooperation of the Professional Products Division of the Ampex Corporation, we have every reason to succeed as the nation's first videotape network by 1960.


DOUGLAS
BAYFIELD
ASHLAND
IRON
WHSA
89.3 mc.
VILAS
WASHBURN
SAWYER
BURNETT
PRICE
FOREST
FLORENCE
ONEIDA
POLK
BARRON
RUSK
MARINETTE
LINCOLN
LANGLADE
OCONTO
TAYLOR
ST.CROIX
DUNN
CHIPPEWA
SHAWANO
DOOR
MARATHON
CLARK
WHWC
88.3 mc.
PIERCE
EAU CLAIRE
WHRM
91.9 mc.
PEPIN
WOOD
PORTAGE
WAUPACA
BROWN
KEWAUNEE
BUFFALO
TREMPEALEAU
JACKSON
OUTAGAMIE
JUNEAU
ADAMS
WAUSHARA
WINNEBAGO
CALUMET
MANITOWOC
MONROE
WHKW
88.3 mc.
LA CROSSE
WHLA
90.3 mc.
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
VERNON
SAUK
COLUMBIA
DODGE
WASHINGTON
OZAUKEE
RICHLAND
CRAWFORD
DANE
JEFFERSON
WAUKESHA
MIL.
GRANT
IOWA
WHA-FM
88.7 mc.
WHHI
91.3 mc.
WHAD
90.7 mc.
LAFAYETTE
GREEN
ROCK
WALWORTH
RACINE
KENOSHA
0
20
40
60
80
SCALE OF MILES

WISCONSIN STATE BROADCASTING SERVICE
FM NETWORK COVERAGE

———— 50 microvolts per meter

— — — 1000 microvolts per meter

Program service by rebroadcast.

September, 1959

Figure 1

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. John Stiehl

Chief Engineer, Stations WHA-AM-FM-TV
Wisconsin Radio Council Network, University of Wisconsin

In talking about radio, I feel, I suppose, somewhat like the doctor must feel when he does a post mortem. Although radio by no means is dead, it is not nearly as glamorous, I guess, as television. We operate eight FM stations (Figure 1) as rebroadcast stations, together with two AM stations, and these ten stations give us complete state coverage.

There are lots of problems which are a little different than television microwave links will offer; some of them I think are probably as complicated, lots of them less so.

Program origination is at Madison (Dane County) in the lower central part and is distributed in two legs, up the east side of the state and up the west side to an area near Superior (Douglas County), which is approximately 350 miles away.

The transmitting equipment and antennas are so situated that it's possible to cross-transmit or take short cuts in the event of a relay or a transmitter difficulty. Figure 2 shows data on each station.

We also find that we have a transmission problem in the northern part of the state (the most remote area), where the hop is too great for reliable transmission in the event that we have a high noise level. For that problem we have used a microwave relay, 945 megacycles, a studio transmitter link located about 50 miles from the receiving location.

So with that general plan I will say a few things about reliability and the quality of program handling.

In general, critical listening tests are the most important. We make technical requirements at each station and find we have no trouble in staying within the FCC requirements. However, in the long run it's the person who is listening, together with the particular type of receiver he uses, who is the one to be the final judge.

We have discovered in some cases where there were perfect technical standards —which you may remember was also true in the case of the early transcriptions—they didn't sound as pleasing as they should to the ear.

So we have felt in each case that a good, thorough listening test was as important a yardstick as anything. We find that listener reaction is excellent even after the number of rebroadcasts which have been carried out.

On the eastern side of the state, programs are rebroadcast three times, involving the use of four transmitters and three receivers. On the western side of the state, the programs are rebroadcast five times. The equipment which we use is all standard equipment. It has not been manufactured for any particular special purpose.

Noise problems, I think, are the greatest and are contributed in several ways. First, of course, is the problem of proper tube selection in the receivers. We use REL crystal control receivers which give very little trouble. But it's necessary to pay particular attention to the careful selection of tubes for low noise.

I think the greatest problem comes from improper operation of transmitting equipment and from tower and transmission line maintenance. We have discovered that a loose member on the tower, a loose lighting cable, de-icing cable, or any of a great number of mechanical parts which can come loose over a period of years will generate more noise than the inherent troubles in the system itself.

So when we hear our noise level rise at any time, we know that it is a signal to begin looking for future breakdown, and we have discovered several transmission line difficulties, tower problems, etc., in that manner where otherwise (if we were being fed by wire or from a microwave system) we should have had no indication until the breakdown occurred.

The transmitters and receivers are arranged so that each receiver operates with approximately 25 to 50 microvolts input, which is in the area of suitable signal for rural listening. The receivers are engineered, however, so that we get complete limiting noise reduction from one to ten microvolts so that we have quite a margin of safety. It becomes necessary because during certain times of the year we get fading—selective fading—which is a problem.

Another source of irritation, I guess you could call it rather than trouble, is the erection of television stations in the immediate area. In the northernmost station—where we're located only thirty miles from Superior, Wisconsin—the construction of Channel 6, which operates in the 82 to 88 megacycle band adjacent to our receiving frequency of 88.3 megacycles, meant that any improper operation of Channel 6 equipment would generate noise which would interfere with the FM reception, since we are both in the same part of the band.

And we discovered for that reason that this particular microwave relay which I referred to was necessary not only to overcome occasional fading which occurred but to permit us to turn off the regular 88.3 megacycle receiver until Channel 6 television equipment could be brought back into proper operation.

Usually a call to the Channel 6 operator's chief engineer brought about their cooperation, and as soon as their trouble was cleared up we were back in business.

The microwave link is in continuous operation and can be used at any time as necessary.

WISCONSIN STATE BROADCASTING SERVICE: STATION DATA (SEPTEMBER 1959)

STATION	LOCATION	COUNTY	SIGNIFICANCE OF CALL LETTERS	BEGAN OPERATION
WHA-FM	Madison	Dane	WHA-affiliated FM	March 30, 1947
WHAD	Delafield	Waukesha	D - Delafield	May 30, 1948
WHKW	Chilton	Calumet	(none)	January 1, 1949
WHRM	Rib Mt. Park	Marathon	RM - Rib Mountain	June 10, 1949
WHWC	Colfax	Dunn	WC - West Central	June 28, 1950
WHLA	West Salem	La Crosse	LA - La Crosse County	November 21, 1950
WHHI	Highland	Iowa	HI - Highland	September 14, 1952
WHSA	Brule	Douglas	SA - Superior-Ashland	September 14, 1952
WHA	Madison	Dane	(none)	1917 as 9XM
WLBL	Auburndale	Wood	(none)	1922 as WPAH
WHA-TV	Madison	Dane	WHA-affiliated TV	May 3, 1954

CALL LETTERS	FREQUENCY	TRANSMITTER MAKE	TRANSMITTER POWER	EFFECTIVE RADIATED POWER	ANTENNA TYPE	NO. BAYS	ANTENNA HEIGHT	TOWER HEIGHT	OVER-ALL TOWER HEIGHT	TOWER BASE ABOVE SEA LEVEL	TOWER TOP ABOVE SEA LEVEL	CALL LETTERS
WHA-FM	88.7	GE	3,000	22,500	Collins 37M8	8	250	250	274	920	1194	WHA-FM
WHAD	90.7	REL	10,000	51,700	GE	6	215	155	215	1230	1445	WHAD
WHKW	89.3	REL	10,000	51,700	RCA Pylon	4	454	400	454	1180	1634	WHKW
WHRM	91.9	Westinghouse	10,000	74,760	RCA BFA-8A	8	535	535	535	1901	2436	WHRM
WHWC	88.3	REL	10,000	50,000	RCA Pylon	4	504	450	504	1260	1764	WHWC
WHLA	90.3	REL	7,500	38,300	RCA Pylon	4	404	350	404	1320	1724	WHLA
WHHI	91.3	Westinghouse	10,000	51,500	RCA Pylon	5	454	400	454	1220	1674	WHHI
WHSA	89.9	REL	7,500	37,800	RCA Pylon	4	454	400	454	1363	1817	WHSA
WHA	970	Westinghouse	5,000		T			200		870	1070	WHA
WLBL	930	Composite	5,000		Vertical			455		1220	1675	WLBL
WHA-TV	Ch.21	RCA	1,000	10,700	Federal	4	274	250	274	920	1194	WHA-TV

Wisconsin State Broadcasting Service
Radio Hall — U. W. Campus
Madison, Wisconsin

Figure 2

PROPOSED TWO-WAY MICROWAVE TELEVISION NETWORK FOR WISCONSIN

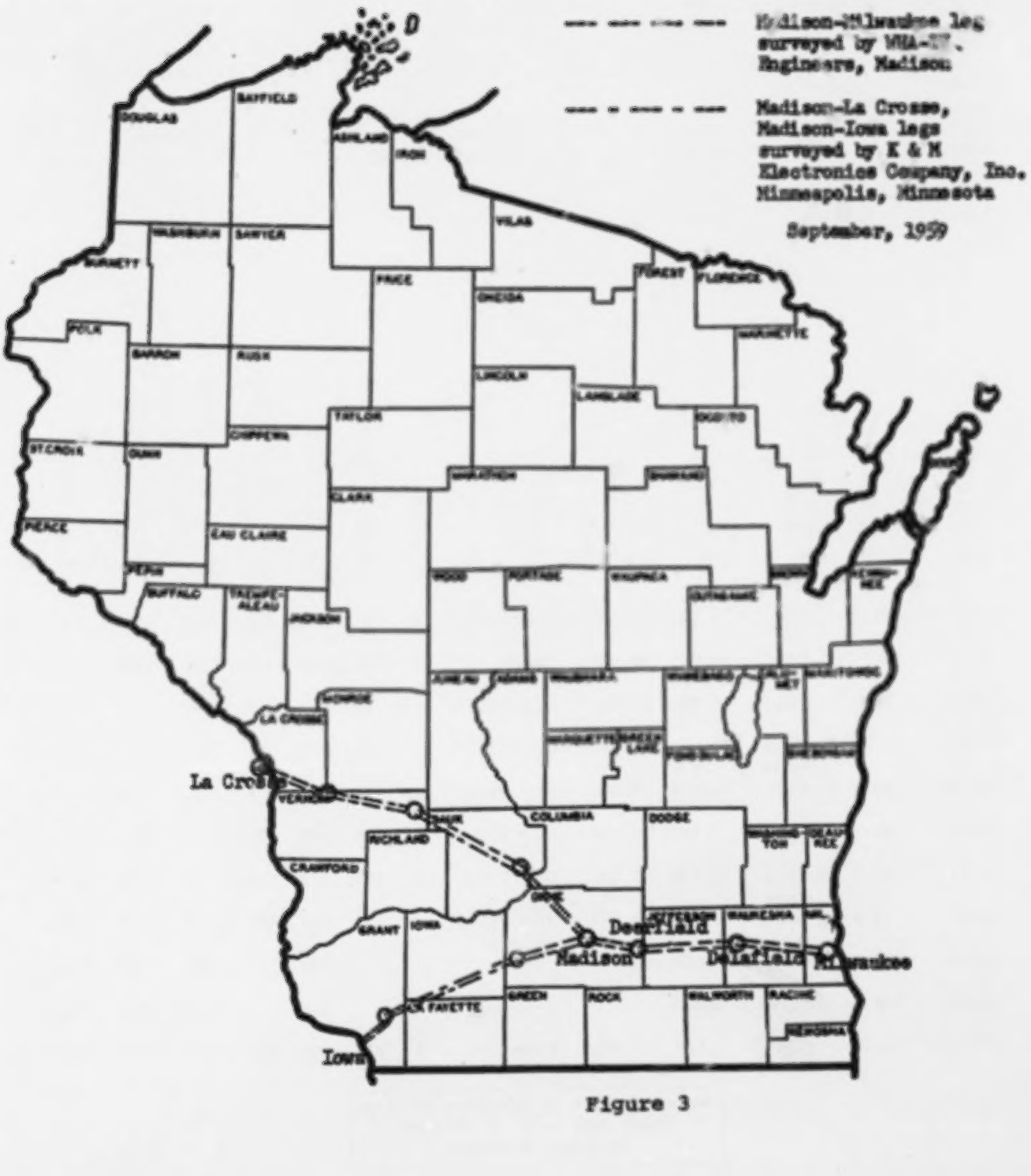

Madison-Milwaukee leg surveyed by WHA-TV. Engineers, Madison
Madison-La Crosse, Madison-Iowa legs surveyed by K & M Electronics Company, Inc. Minneapolis, Minnesota
September, 1959
D
DOUGLAS
BAYFIELD
ASHLAND
IRON
VILAS
WASHBURN
SAWYER
BURNETT
PRICE
ONEIDA
FOREST
FLORENCE
MARINETTE
POLK
BARRON
RUSK
LINCOLN
LANGLADE
OCONTO
TAYLOR
ST.CROIX
DUNN
CHIPPEWA
MARATHON
SHAWANO
CLARK
PIERCE
EAU CLAIRE
PEPIN
BUFFALO
TREMPE-ALEAU
JACKSON
WOOD
PORTAGE
WAUPACA
OUTAGAMIE
BROWN
KEWAU-NEE
JUNEAU
ADAMS
WAUSHARA
WINNEBAGO
CALU-MET
MANITOWOC
MONROE
LA CROSSE
MARQUETTE
GREEN LAKE
FOND DU LAC
SHEBOYGAN
La Crosse
VERNON
SAUK
COLUMBIA
DODGE
RICHLAND
CRAWFORD
WASHING-TON
OZAU-KEE
DANE
JEFFERSON
WAUKESHA
MIL.
Deerfield
GRANT
IOWA
Madison
Delafield
Milwaukee
LA FAYETTE
GREEN
ROCK
WALWORTH
RACINE
KENOSHA
Iowa

Figure 3

Along with this FM network (Figure 1), we operate also two AM stations, one located near the center of the state (Wood County) on 930 kilocycles and one operated in Madison (Dane County), a short distance from the FM transmitter on 970 kilocycles. These are stations which service those people who still refuse to recognize the advantages of FM or who for some reason or other prefer to use the AM equipment.

The FM network, of course, has a good future, we think, with the advent of multiplexing, which, while some people are interested particularly in stereo operation, we feel has a greater potential in providing a second program source.

We hope that the transmission of weather and market information, for instance, might play a real part—not only in the general program service, but to provide programs for special interests such as trucking companies, farmers, or people involved in commercial enterprises. And so we are looking forward to extended use of network multiplex operation.

Our FM network is arranged so that, while program service generally originates in Madison, it can be supplied from any of the FM transmitter sites. That is, we have at each station portable tape equipment which may be used to record programs right at the transmitter site or which can be taken out into the counties surrounding the transmitter and used for program sources there. That is quite often done.

In addition to that, we do a twice-daily weather summary from each of these stations in which the operator records a summary of the last twelve hours of weather in his immediate area, and this has turned out to be one of our very popular programs and is again used extensively by commercial groups, power companies, trucking companies and farmers.

One word about television plans. Mr. Schwarzwalder will report, I believe, on the network plans for the six Midwest States. In addition to what he will say, we have a little project we're thinking about which involves both the university at Madison and the vocational school in Milwaukee, each of which at the present time is operating a noncommercial educational television station, we at Madison on Channel 21, the vocational school in Milwaukee on Channel 10.

At the present time the programing is done locally with a large section of the programs devoted to film. So we hope in the near future to be able to tie these two stations together with a two-way microwave unit.

A preliminary survey by WHA-TV engineers indicates that a three-hop microwave link is feasible between WHA-TV studios in Madison and those of WMVS in Milwaukee (Figure 3). The first repeater located near Deerfield, about 24 miles east of Madison, would be located on a 200' guyed tower. The second hop would be 31 miles to a site and tower now used by the State Radio Council's FM station, WHAD, near Delafield, Wisconsin. From there to the studios of WMVS, Milwaukee, is a distance of 25 miles. To clear the top of the Milwaukee County building located adjacent to the studios of WMVS, it is proposed to use a passive reflector consisting of two 6' parabolic dishes located back-to-back.

Equipment cost estimates for a two-way system, made by Motorola and RCA in September, 1958, and with the 200' guyed tower at Deerfield now on hand, are approximately $50,000. Maintenance of the equipment at Madison, Deerfield, and Delafield will be done by WHA-TV engineers and at Milwaukee by the staff of WMVS. Emergency power equipment is included.

The network path survey of four hops from Madison to LaCrosse and two hops from Madison to the Wisconsin-Iowa state line was made by the K & M Electronics Company of Minneapolis, Minnesota. All repeater and terminal locations are easily accessible in all types of weather.

A survey for state-wide educational television service in Wisconsin was made in 1958, using the channels then available. This includes two VHF frequencies, Channels 8 and 10, and ten UHF channels--30, 18, 19, 46, 38, 32, 58, 24, 36 and 21. Program service would be provided by a combination of rebroadcast and microwave links, as indicated on the accompanying map (Figure 4). Costs of this system are also included. The uncertain status of the UHF channels and the reluctance of the public to convert where VHF signals are present makes it seem advisable to wait before pushing this plan further. In Madison, where the installation of three UHF stations preceded the building of a VHF station, the conversion is 100 per cent and WHA-TV on its Channel 21 is not faced with a conversion problem. Plans for the near future call for a new antenna and tower location, and a 12 kw amplifier on the WHA-TV transmitter to provide a 40-mile radius Grade B service area. These facilities will make possible an expanded teacher-training schedule and provide classroom instruction for schools in the Madison-Milwaukee area, where approximately 50 per cent of the state's population is located.

So in addition to the regular two-way microwave network which may become a reality in the six states, we hope to add this link between Madison and Milwaukee.

One feature which I think ought to be given real consideration arises out of a request which has been made to explore the possibilities of using these microwave networks for conference purposes. Now, I realize that this is not in accordance with what the FCC permits at the present time, but it should, I think, involve some serious thinking, because in the event we ever do get a real two-way microwave network among our educational stations the use for actual on-the-air operation, of course, will be very small compared to the twenty-four hours per day of time available.

And I can foresee a time when program previews and conference meetings of all sorts, a round-robin sort of thing, might be a terrific aid in program handling.

This is something that I think will take a lot of work and exploration and should be given some serious thought.

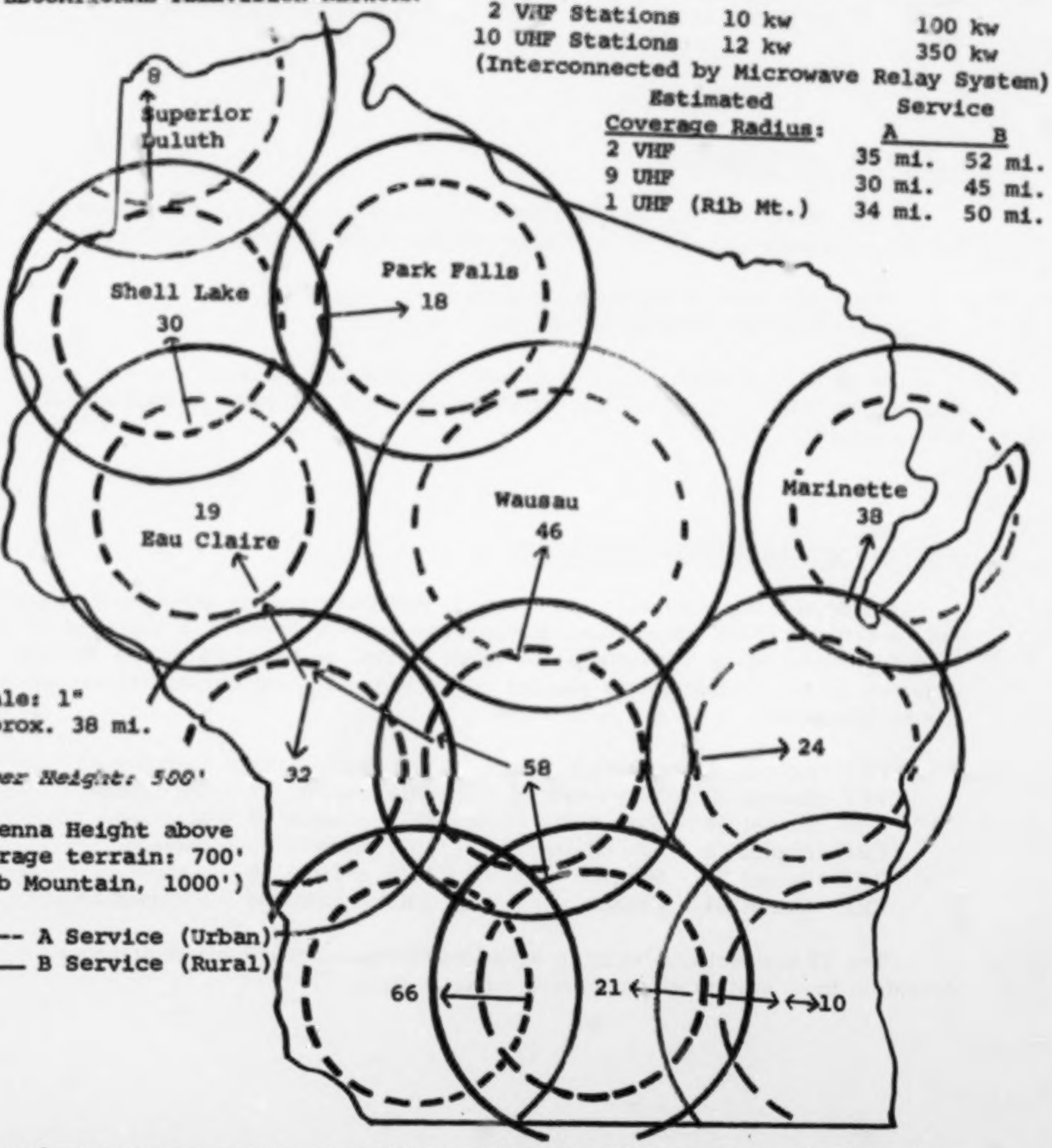
State of Wisconsin

PROPOSED NONCOMMERCIAL
EDUCATIONAL TELEVISION NETWORK

	Transmitter Power	Effective Radiated Power
2 VHF Stations	10 kw	100 kw
10 UHF Stations	12 kw	350 kw

(Interconnected by Microwave Relay System)

Estimated Coverage Radius:	Service A	B
2 VHF	35 mi.	52 mi.
9 UHF	30 mi.	45 mi.
1 UHF (Rib Mt.)	34 mi.	50 mi.


8
Superior
Duluth
Shell Lake
30
Park Falls
18
19
Eau Claire
Wausau
46
Marinette
38
32
58
24
66
21
10

Scale: 1"
Approx. 38 mi.

Tower Height: 500'

Antenna Height above
average terrain: 700'
(Rib Mountain, 1000')

----- A Service (Urban)
—— B Service (Rural)

Circular coverage patterns would be modified slightly by variations in topographyl Alterations in antenna radiation patterns could reduce overlapping and provide some coverage additions not shown.

Figure 4

To: Wisconsin Legislative Council
From: Wisconsin State Radio Council
Subject: EDUCATIONAL TELEVISION - Report No. 4
Date: April 1, 1954

ESTIMATED COVERAGE AND COSTS OF A NON COMMERCIAL EDUCATIONAL TELEVISION NETWORK FOR THE STATE OF WISCONSIN

I. REFERENDUM QUESTION

Joint Resolution 74A by the 1953 Legislature provides for the submission, for advisory purposes, to the electorate on November 2, 1954, the following:

> "Shall the state of Wisconsin provide a tax-supported state-wide noncommercial educational television network?"

To provide background for a consideration of that question, we are submitting at this time a report on the estimated coverage and costs of such a state-wide network.

II. STATE-WIDE TELEVISION NETWORK

To provide noncommercial educational television service throughout Wisconsin, a network of 12 transmitting stations has been proposed — 2 VHF and 10 UHF transmitters of 10-12 kilowatts power each, located as indicated by the Federal Communications Commission's channel reservations for noncommercial educational use in Wisconsin:

VHF channel 8 - Superior-Duluth
VHF channel 10 - Milwaukee
UHF channel 18 - Park Falls
UHF channel 19 - Eau Claire
UHF channel 21 - Madison
UHF channel 24 - Chilton
UHF channel 30 - Shell Lake
UHF channel 32 - La Crosse
UHF channel 38 - Marinette
UHF channel 46 - Wausau
UHF channel 58 - Adams
UHF channel 66 - Richland Center

The 12 transmitting stations would be interconnected for simultaneous operation by a system of microwave relay stations.

III. ESTIMATED COVERAGE

As shown on the accompanying map, the proposed network would provide state-wide service. Coverage contours based on engineering data issued by the Federal Communications Commission indicate the following grades of service and population percentages:

	Population (1950 Census)	% of Total
Within Grade A Service Area	2,443,681	71.17
Outside Grade A, Within Grade B	920,016	26.75
Total Within Grade A and B	3,363,697	97.92
Outside Grade B but receiving some service in favorable locations	70,878	2.08
Total	3,434,575	100.00%
Receiving better than Grade A Service - population in cities over 10,000 within 12-15 miles of a transmitter	913,521	26.3%

Grade A service is regarded as sufficient for most residential areas of cities over 10,000 population and all areas, including commercial and industrial, of cities under 10,000.

Grade B service is sufficient for all rural areas and for communities of 2,500 or less.

IV. TECHNICAL DEFINITION OF COVERAGE TERMS

The terms Grade A and Grade B service area are defined in the Standards of Good Engineering Practice, Rules and Regulations of the Federal Communications Commission, as follows:

All UHF Channels

Grade A service area is one in which the estimated signal strength is equal to or greater than 5,000 microvolts per meter and is exceeded at 50% of the potential receiver locations for at least 50% of the time at a receiving antenna height of 30 feet.

Grade B service area is one in which the estimated signal strength is equal to or greater than 1,600 microvolts per meter and is exceeded at 50% of the potential receiver locations for at least 50% of the time at a receiving antenna height of 30 feet.

VHF Channels 8 and 10

Grade A service area — same as above except the signal strength is equal to or greater than 3,300 microvolts per meter.

Grade B service area — same as above except the signal strength is equal to or greater than 630 microvolts per meter.

V. ESTIMATED CONSTRUCTION AND EQUIPMENT COSTS OF STATE TELEVISION NETWORK

	Cost of each VHF Station Ch. 10 Milw. Ch. 8 Superior	Cost of each UHF Station	To increase WHA-TV power, Move out of city, new tower
12 kw. Amplifier (to boost present WHA-TV transmitter)			$ 90,000
10 kw. VHF Transmitter and Diflexer	$ 85,000		
12 kw. UHF Transmitter & Filterplexer		$130,000	
Tower (500 ft. guyed)	40,000	40,000	40,000
Antenna (12 bay VHF; 40-50 gain UHF)	40,000	30,000	30,000
Transmission Line and Accessories	10,000	13,000	13,000
Transmitter House	25,000	25,000	25,000
RF Wattmeter and Load	1,500	3,000	3,000
Land (6 acres)	2,000	2,000	2,000
Well and Pump	1,800	1,800	1,800
Controls and Monitors	8,000	8,000	
Stabilizing Amplifier, Power Supply	1,000	1,000	
Test Equipment	8,000	8,000	
Furnishings	2,000	2,000	2,000
Receiver	1,500	1,500	1,500
Engineering and Construction	2,000	2,000	2,000
Contingencies	5,000	5,000	5,000
Madison Studio-Transmitter Relay Link			15,000
Cost of each	$232,800	$272,300	$ 228,300
Cost of 2 VHF Stations			465,600
Cost of 9 UHF Stations			2,450,700
Subtotal 12 Transmitting Stations			$3,144,600
Estimated savings by locating 5 Stations at present FM sites			150,000
Total 12 Transmitting Stations			$2,994,600
Microwave Relay System - (estimate based on data supplied by Motorola)			325,000
TOTAL COST 12 TRANSMITTING STATIONS AND MICROWAVE RELAY SYSTEM			$3,319,600
Additional Madison Studio Facilities and Equipment			175,000
Total Network Construction and Equipment (including supplement to present studios)			$3,494,600

VI. IMPROVEMENTS OVER PREVIOUS PROPOSAL

The transmitting facilities outlined in the preceding pages are calculated to provide more coverage and greater signal strength than the stations proposed in previous reports.

These improvements are the result of recent technical developments which produce UHF transmitters of greater power and UHF antennas of higher gain than were specified in earlier proposals. Instead of UHF transmitters of 10 kilowatts power, the present plan calls for 12 kilowatts. Instead of antennas formerly limited to a gain of 24, the present plan takes advantage of new designs increasing UHF antenna gain to 40-50.

These recent manufacturing developments make possible an effective radiated power of 350-400 kilowatts on UHF, compared with 200 kilowatts specified in previous proposals. In turn, this great increase in effective radiated power produces the following results:

1. Increase of 41% in signal strength throughout the service area.
2. Increase of approximately 20% in the areas covered.

With these gains in transmitting capacity and coverage have come slightly higher prices. Other changes have also been made in the cost estimates, including certain savings and economies not previously calculated. The increase in this estimate over previous estimates is explained mainly by the following differences:

1. This estimate includes the full cost instead of partial cost of transmitting stations at Milwaukee and Superior.
2. The new 12 kilowatt UHF transmitters now available are priced $10,000 higher than the earlier estimated cost for 10 kilowatts. This accounts for a total difference of $100,000.
3. Likewise, the new higher gain UHF antennas are priced $10,000 higher than earlier models. Ten of these antennas would be required, accounting for an additional difference of $100,000.
4. An expanding program of research and course instruction in television at the University of Wisconsin places increasing demands on the present TV Laboratory and limits the use that can be made of it for broadcasting. To prevent interference with the research and teaching functions that must be performed, additional studio facilities and equipment will be required to maintain an expanded schedule of broadcasts.

VII. TRANSMITTER CONVERSION TO COLOR

Radio Corporation of America recently announced that it will convert RCA black and white transmitters to color transmitters at no cost whatever to the owner or purchaser for engineering services.

It is expected that the transmitter equipment expense for color conversion would be approximately $10,000 for each station.

VIII. ESTIMATED ANNUAL COST OF OPERATING TRANSMITTING FACILITIES

Minimum Schedule 6 Hours Daily
Program Costs Not Included

	Each 10 kw. VHF Station	Each 12 kw. UHF Station
Personal Services		
Operators	$ 5,000	$ 5,000
Engineering Supervision	1,000	1,000
Tubes	5,000	10,000
Power		
VHF (45+5 = 50 kw.) 300 kw. hrs. per day @ 2.5¢	2,737	
UHF (55+5 = 60 kw.) 360 kw. hrs. per day @ 2.5¢		3,285
Equipment Repairs and Replacements	1,500	1,500
Other Materials and Expense	1,000	1,000
Total each	$16,237	$ 21,785

(see the following page)

VIII. Continued

SUMMARY

Operation 2 VHF Stations @ $16,237	$ 32,474
Operation 10 UHF Stations @ $21,785	217,850
Operation Relay System	25,000
Subtotal Annual Operation	$275,324
Less Savings on Operators, Maintenance, etc. by locating 5 stations at present FM sites	35,000
TOTAL ANNUAL COST OF OPERATING 12 TRANSMITTING STATIONS AND RELAY SYSTEM (Minimum Schedule 6 hours daily) (Program Costs are not included)	$240,324

(Estimated annual cost of operating entire transmitting system for each additional hour of daily service: $25,000 - $30,000)

IX. ESTIMATED ANNUAL COSTS OF OPERATING STUDIOS AND PROVIDING PROGRAM SERVICE

The determination of programing costs is one of the purposes for which the 1953 Wisconsin Legislature authorized the establishment of an experimental television station.

Careful studies of the operation of WHA-TV will supply definite information as a basis for considering extension of service throughout the state. Meanwhile, experience to date indicates that the 1954-55 appropriation of $50,000 will provide the necessary personnel and facilities for the origination of 9-12 hours of programing per week. Supplementary programs on film and kinescope from outside sources at nominal cost will permit a schedule of 12-15 hours per week.

Using these figures as the best information available at the monent, we get the following estimate:

	1954-55 Appropriation Aver. 10 hrs. week original produc.	Estimated Cost of Programing 6 hrs. daily 42 hrs. week
Personal Services	$38,000	$160,000
Materials and Expense	12,000	40,000
Total	$50,000	$200,000

The increasing availability of programs from other educational stations and agencies, as well as the introduction of expected economies in video recording and techniques, may very well permit an expansion of the proposed schedule from 6 to 8 hours daily at little or no increase in the estimated cost of $200,000.

X. ESTIMATED TOTAL PROGRAMING AND OPERATING COSTS

There are basic items of expense involved in the production of programs whether the programs are broadcast over commercial stations or the state's own facilities.

Utilization of television as a medium of information and instruction by the educational institutions and public service agencies of the state will involve inescapable costs. The availability of limited amounts of "free time" does not mean that programs could be presented without expense. Hence, programing costs and the costs of operating transmitting facilities are shown separately:

Annual Programing Costs	$200,000
Annual Transmitting Costs	240,324
TOTAL ANNUAL NETWORK OPERATION (Minimum Schedule 6 hours daily)	$440,324

XI. LOW COSTS EXPLAINED

Why are these estimates so much less than the costs of commercial station production and operation? There are several explanations, including the following:

1. Educational broadcasting enjoys the advantage of volunteer, unpaid services of faculty members, extension workers, and state employees who recognize in television a means of multiplying the number of people they can serve, and who contribute above and beyond their regular work load.
2. Unpaid University students in training in television courses make up approximately 40% of the studio personnel required.
3. Lower salaries for staff members are possible because of the other satisfactions in educational work.
4. Programs from other educational stations and sources are available through the Educational Television and Radio Center at nominal cost. (Example: Initial subscription fee for 5-10 hours of programs per week, $100 per month.)
5. Economies are effected through integration of television with the existing radio service, permitting, for example, the operation of the television transmitter by the operator already on duty at the adjacent radio transmitter, without additional expense.
6. Educational broadcasting is exempt from commercial royalties and fees, and is eligible for certain educational discounts.

XII. SUBSEQUENT REPORTS

At the suggestion of the State Radio Council -- a suggestion which was incorporated in the legislative act authorizing the establishment of WHA-TV — the Radio Council expects to report periodically on television costs to the Wisconsin Legislative Council and in turn to the 1955 Legislature. Such information will be available also to all interested citizens.

Specific inquiries from legislators and others are invited and welcomed. They may be addressed to the State Radio Council, Radio Hall, Madison.

Respectfully submitted,

WISCONSIN STATE RADIO COUNCIL
H. B. McCarty, Executive Director
Glenn Koehler, Technical Director

April 1, 1954

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Cyril Braum

Engineering Consultant
Joint Council on Educational Television

I thought it might be helpful to cover some of the general rules affecting educational radio and television networks and the planning of such networks. In planning such networks, it is obviously necessary to consider FCC policies and rules that apply. Some of these regulations are of long standing, while others are recent and, to some extent, not yet final.

First let us consider radio networking. AM stations have, since the first networks were established over thirty years ago, used common-carrier wire circuits, and no radio channels are allocated or available for connecting them. Commercial FM stations, usually associated and programed with AM stations, normally use the same network wire circuits. In a few cases, commercial FM stations have employed common-carrier wire circuits having higher fidelity. In other instances, FM stations have rebroadcast one another by direct off-the-air pickups, and sometimes a combination of wire circuits and rebroadcasting is used.

Educational and commercial FM stations may, under certain circumstances, provide their own intercity connections by using channels in the 940 mc range that the FCC has allocated for studio-transmitter link (or STL) stations. Such stations are normally used for program circuits from the studios of AM and FM stations to their remotely located transmitters, and these channels may also be used by TV stations for transmitting the sound portion of their programs to their transmitters. The FCC permits these channels to be used by FM stations for interconnection purposes when suitable common-carrier facilities are not available. If high quality wire circuits cannot be furnished over particular routes, FM intercity relay stations may be authorized. There has, however, been very little activity in this service to date.

In fact, the only one I know of is the one Mr. Stiehl mentioned a few moments ago, one located in northern Wisconsin. I might also say I believe FCC will liberalize policy on intercity stations so it will not be necessary to show that common-carrier facilities are available for this purpose.

Since 940 mc transmission requires a line-of-sight path, perhaps thirty miles would be an average distance that could be covered by a single relay station. The distances would be similar to those in TV microwave networks and since the same antenna towers and buildings could be used, construction and operating costs would be reduced.

It might be worthwhile in planning TV and microwave networks to consider these intercity FM stations. Although the equipment is somewhat costly, it furnishes an excellent service, and I think that the FCC will be very cooperative in issuing authorizations. I might also add that I think TV microwave equipment or other microwave equipment with multiplexing could be used for sound circuits between cities.

In the television field, microwave channels have been allocated for many years for TV pickup and TV STL purposes. The principal bands are in the 2,000, 7,000, 10,000 and 13,000 mc ranges. Most TV pickup and STL transmitters operate in the 7,000 mc band, with recent increased use of the 2,000 mc band. Other bands have been used very little, due in part to limited need to date and the resulting slowness in equipment development. Many educational TV stations use TV STL transmitters, and a few have mobile units for TV pickup use on these channels.

In cases where intercity facilities were not available from the common carriers, the FCC has for many years permitted TV broadcasters to install their own microwave relay systems on a temporary basis. Several dozen such systems have been built, principally of one to three relay stations for bringing commercial network programs to their TV stations. In Alabama, the FCC authorized STL stations to connect three educational TV studios to three transmitters, operating in a network fashion with all transmitters programed simultaneously from any of the three studios.

In response to requests of educational and commercial TV interests, in 1958 the FCC liberalized its policy concerning privately owned intercity microwave facilities. Under certain circumstances, the FCC now permits educational and commercial TV broadcasters to install their own intercity facilities instead of requiring common-carrier circuits to be used. Direct interconnection with common-carrier facilities is not permitted, nor may privately owned microwave relay stations be used as intermediate links in common-carrier intercity circuits. TV stations may pick up other TV stations and send the programs over their own microwave systems to their TV transmitters for rebroadcast, and many commercial stations in remote areas now do this.

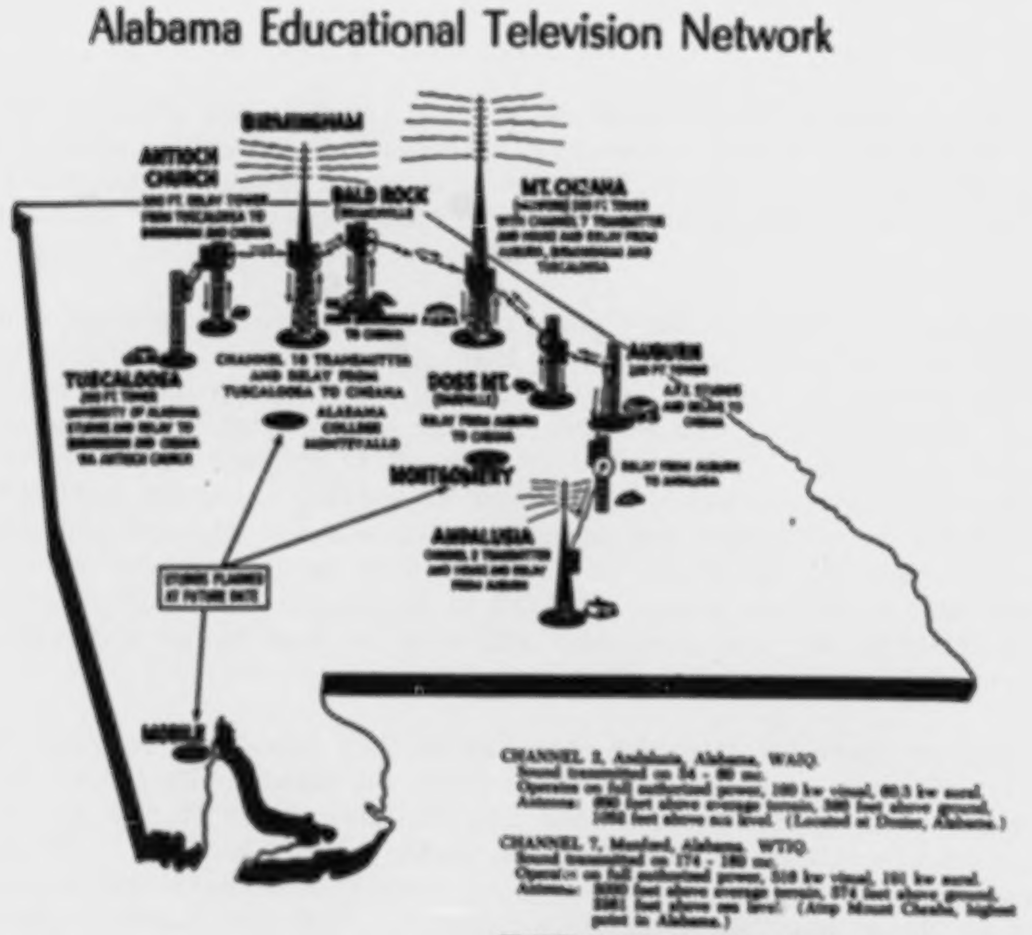
Since educational television networks would normally be independent of common-carrier circuits, it is possible under this new policy to establish complete microwave systems for interconnecting ETV stations. The various bands of microwave channels assigned for TV pickup and STL use are also available for intercity use. The circuits may be used for broadcast programs and material associated therewith, such as programs for kinescoping or taping for later broadcast, but they may not be used for closed-circuit purposes.

With regard to closed-circuit microwave facilities, educational interests participated in the 1957 FCC hearings on allocations above 890 mc. Requests were made for microwave channels for local and for intercity use, including closed-circuit educational TV networks, on frequencies that would be suitable for the distances involved. It was proposed that frequencies for intercity use be no higher than 7,000 mc, since higher frequencies are more subject to fading and other vagaries caused by rain and various weather conditions.

The hearing record was voluminous, and a great many proposals and requests were filed. A month ago the FCC announced its basic decisions in this docket, including the general findings that (1) adequate frequencies are available above 890 mc to take care of foreseeable future needs of common carriers and private users, and (2) the licensing of private communications systems would not adversely affect common carriers. At the same time, the FCC issued a notice of proposed rule-making concerning channel widths in the various microwave bands that would be available for licensing.

The Commission's decision does permit microwaves to be used for closed-circuit educational use, but such use would, at least at the present state of microwave development, be limited to intracity or local areas. The reason is that the FCC proposes channel widths below 10,000 mc that are not wide enough for television operation. Channels of adequate width for TV are around 12,000 mc and above, which is satisfactory for local use but which would limit networking severely. (An AT&T exhibit in the hearing indicated that one hundred miles was the present limit for TV, and two hundred miles for telephone, of a system they have developed for 11,000 mc.) The JCET has filed a petition asking the FCC to reconsider its decision as it affects closed-circuit intercity TV, and comments will soon be filed in the proposed rule-making matter concerning channel widths.

Plans may be made for intercity networks of ETV broadcast stations, therefore, with microwave channels available for this purpose as listed in Part 4 of the FCC Rules. Closed-circuit microwave channels are available above 10,000 mc, and educational institutions are eligible in the Business Radio Service in Part 11 of the FCC Rules. Closed-circuit TV network planning for considerable distances, however, must be contingent on the availability of suitable channels. Definite, positive planning for closed-circuit TV network systems will be helpful in pointing out to the FCC that such channels are needed and, if provided, will soon be used.


Alabama Educational Television Network
BIRMINGHAM
ANTIOCH CHURCH
BALD ROCK
MT. CHEAHA
TUSCALOOSA
CHANNEL 10 TRANSMITTER AND RELAY FROM TUSCALOOSA TO CHEAHA
ALABAMA COLLEGE MONTEVALLO
DOSS MT.
AUBURN
MONTGOMERY
ANDALUSIA
STUDIOS PLANNED AT FUTURE DATE
MOBILE

CHANNEL 2, Andalusia, Alabama, WAIQ.
Sound transmitted on 54 - 60 mc.
Operates on full authorized power, 100 kw visual, 60.3 kw aural.
Antenna: 890 feet above average terrain, 380 feet above ground, 1050 feet above sea level. (Located at Dozier, Alabama.)

CHANNEL 7, Munford, Alabama. WTIQ.
Sound transmitted on 174 - 180 mc.
Operates on full authorized power, 316 kw visual, 191 kw aural.
Antenna: 2000 feet above average terrain, 374 feet above ground, 2381 feet above sea level. (Atop Mount Cheaha, highest point in Alabama.)

CHANNEL 10, Birmingham, Alabama. WBIQ.
Sound transmitted on 192 - 198 mc.
Operates with 18.6 thousand watts aural, 30.9 thousand watts visual.
Antenna: 830 feet above average terrain, 197 feet above ground, 1187 feet above sea level. (Atop Red Mountain)

FIGURE I - ALABAMA EDUCATIONAL TELEVISION NETWORK

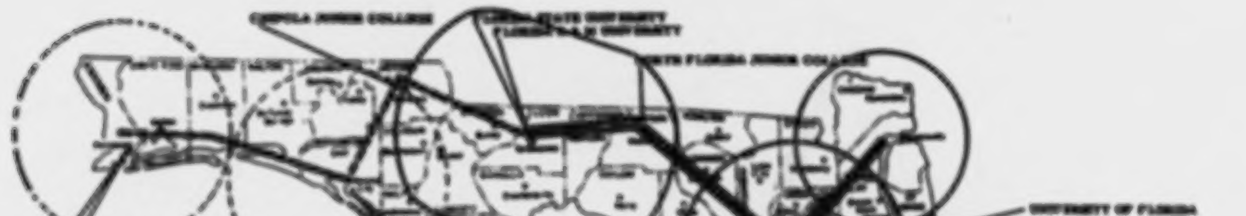

UNIVERSITY OF FLORIDA
Florida's Junior Colleges and Universities and ETV Stations
STATE OF FLORIDA
ETV CHANNELS ACTIVATED OR AUTHORIZED
ETV CHANNELS RESERVED BUT NOT YET ACTIVATED
INTERCONNECTIONS AUTHORIZED TO-DATE
POSSIBLE ROUTES OF LATER INTERCONNECTIONS

FIGURE II - FLORIDA EDUCATIONAL TELEVISION NETWORK

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Duane Weise

Director of Engineering, Station WTTW
Chicago Educational Television Association

This paper is concerned with a review of several proposed Regional Educational Microwave Networks and specifically with proposals for State Educational Microwave Networks in NAEB Region III.

The Washington County closed-circuit educational project at Hagerstown, Maryland, has received the most publicity of all the educational projects. The Hagerstown project was initiated in September, 1956, and is rapidly approaching the finish of a planned five-year program to evaluate the use of television in the school system in order to improve the quality of education. At Hagerstown, coaxial cable is employed for interconnection of receiving sites.

The Alabama Educational Television Network interconnecting three operating Alabama ETV stations via microwave was initiated in February, 1955. The present network consists of eight microwave hops. (Figure I.)

The State of Florida has established a Florida Educational Commission. This commission is moving rapidly toward the establishment of an educational microwave network to interconnect the state's public tax-supported universities, junior colleges, and ETV stations. Figure II illustrates the status of their operation at the present time.

The Southern Regional Education Board has also recently completed a comprehensive study of a major interconnection of southeastern states into an educational microwave network.

The State of Georgia has also been active in investigating the potential of a state educational network for its tax-supported institutions.

It becomes readily apparent that in the southeastern section of the United States the makings of an active regional network exist. It is not difficult to visualize the interconnection of the Florida, Alabama, and Georgia microwave networks for regional educational use.

In the northeastern portion of the United States a preliminary study has been made by a group headed by Hartford Gunn, of WGBH-TV, Boston. Figure III is an illustration of what this group visualizes as a potential educational network for New England and the northeastern seacoast area.

A preliminary survey has been made for the North Central States under the direction of Dr. John Schwarzwalder, of KTCA-TV, Minneapolis, and his associates. Figure IV illustrates the potential network which they visualize for interconnecting educational broadcast stations which have been assigned to the area by the Federal Communications Commission.

Figure V illustrates a possible educational microwave network for the midwestern area in which FCC-assigned and operating ETV stations would be interconnected. The western loop of this proposed network interconnects broadcast operations in the following communities: Chicago, Milwaukee, Madison, Minneapolis, Ames, Des Moines, Lincoln, Kansas City, Columbia, St. Louis, and Champaign-Urbana.

The eastern loop of this proposed network interconnects ETV operations in the following communities: South Bend, East Lansing, Ann Arbor, Detroit, Toledo, Columbus, Cincinnati, Louisville, Carbondale, St. Louis, and Champaign-Urbana.

For the midwest regional area it is apparent that the North Central Network proposed by Dr. Schwarzwalder's group could interconnect with the western half of the Midwest Network. Similarly, it is easy to visualize that the eastern half of the proposed Midwest Network could readily interconnect Columbus, Ohio, with Cleveland, Buffalo, and Syracuse, New York, and thus to the Northeast Network proposed by Hartford Gunn's group.

It thus becomes apparent that, by assembling the proposals of the various regional groups, the foundation for a National Network exists. Up to now, the discussion has been concerned with the formative thinking that has taken place toward the eventual establishment of state, regional, and national microwave systems.

The details of a study that has been undertaken by the NAEB Engineering Committee of Region III (Figure VI) will now be reviewed. The committee is headed by Walter B. Emery and is composed of TV and AM-FM representatives from each of the states within Region III. (See Table I.) The proposals presented by each of the state TV representatives as to what in his judgment is a representative network for interconnecting the institutions of their states shall now be considered.

Figure VII was prepared by H. W. Gorsuch of WOSU-TV, Columbus, Ohio, and represents the thinking of Mr. Gorsuch and his associates as to what a potential educational microwave network might be in the State of Ohio. This particular proposal employs a "spoke" type of microwave system.

Figure VIII portrays the potential educational microwave network visualized by Ralph Townsley of WBAA, Purdue, and his associates for the State of Indiana. Mr. Townsley has employed a closed-loop system for interconnecting the various broadcasting and institutional organizations in Indiana.

Figure IX represents the thinking of Mr. James Wulliman of WMVS, Milwaukee. For the moment, Mr. Wulliman visualizes a microwave system between Milwaukee and Madison, Wisconsin.

Information on proposed networks for the State of Michigan was not available for this paper.

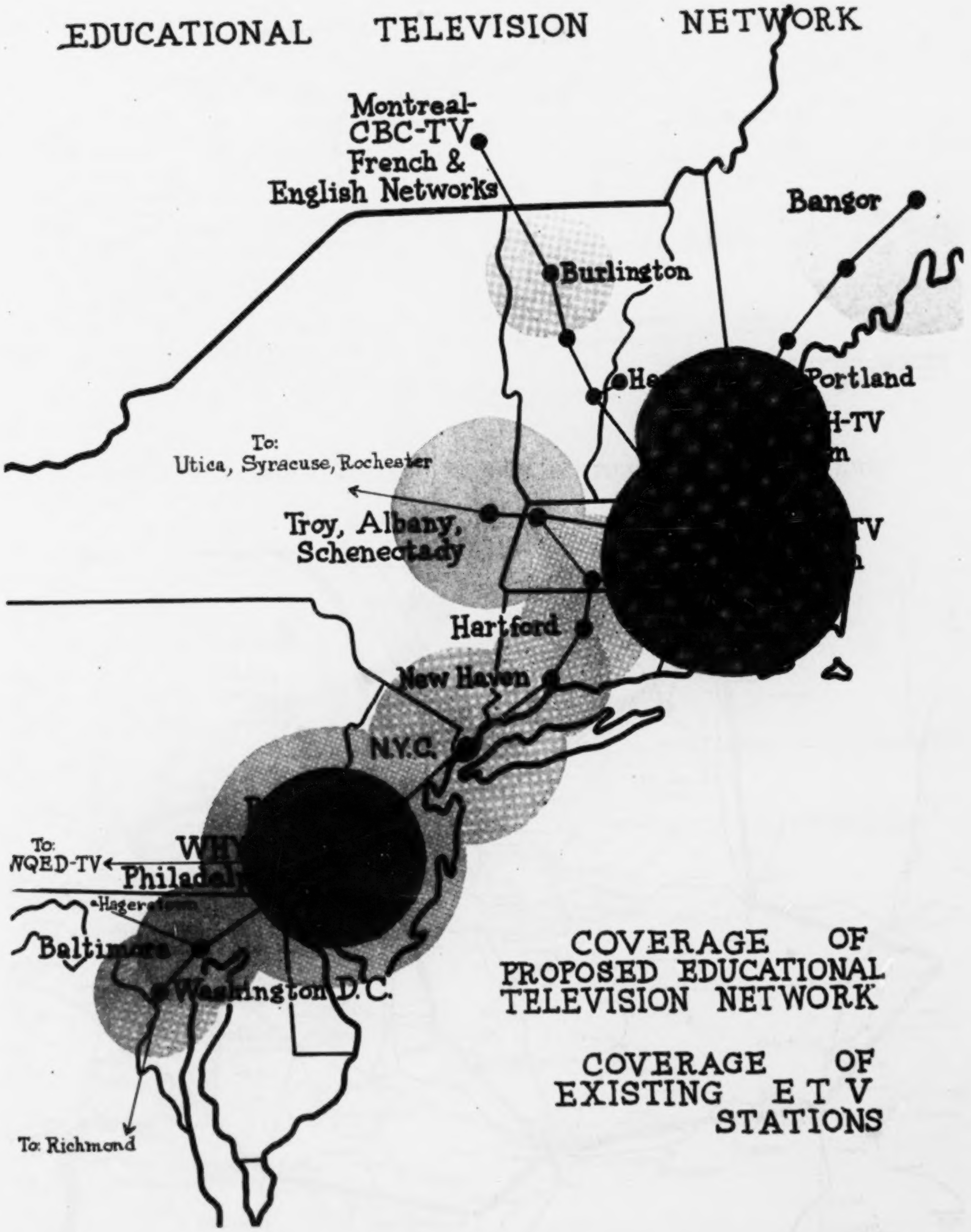
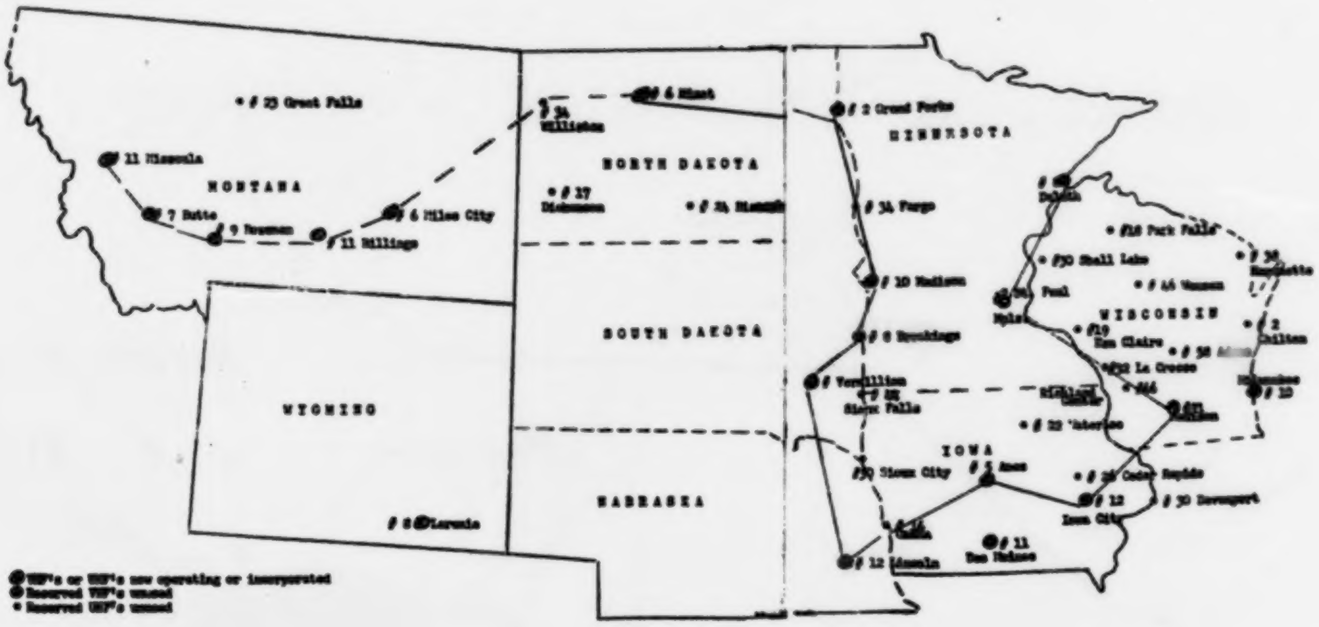
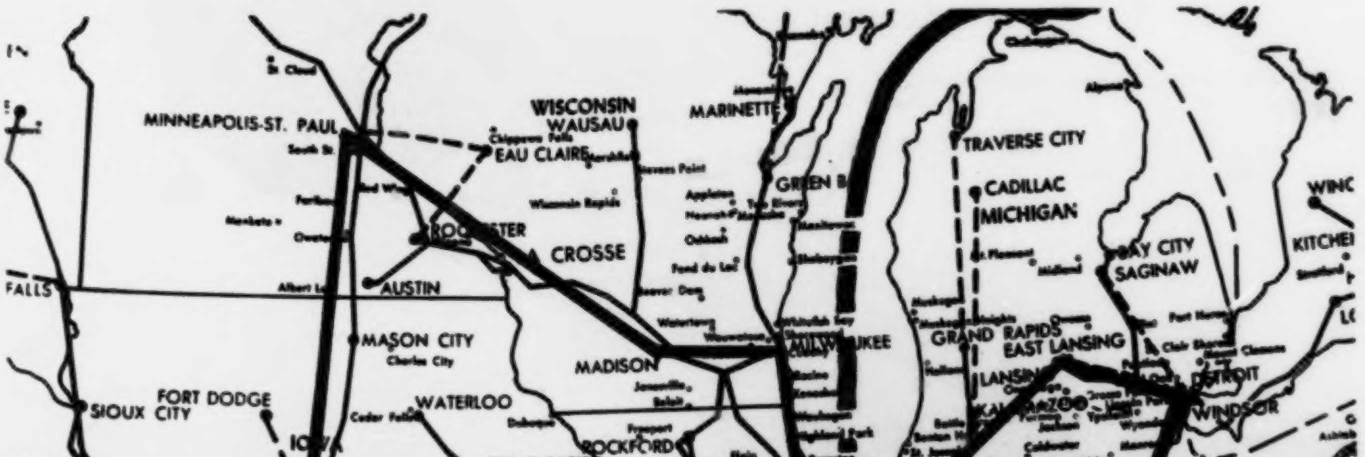

EDUCATIONAL TELEVISION NETWORK
Montreal-CBC-TV French & English Networks
Bangor
Burlington
Portland
To: Utica, Syracuse, Rochester
Troy, Albany, Schenectady
Hartford
New Haven
N.Y.C.
To: WQED-TV
Philadel
Hagerstown
Baltimore
Washington D.C.
To: Richmond
COVERAGE OF PROPOSED EDUCATIONAL TELEVISION NETWORK
COVERAGE OF EXISTING E T V STATIONS

FIGURE III - NEW ENGLAND EDUCATIONAL TELEVISION NETWORK



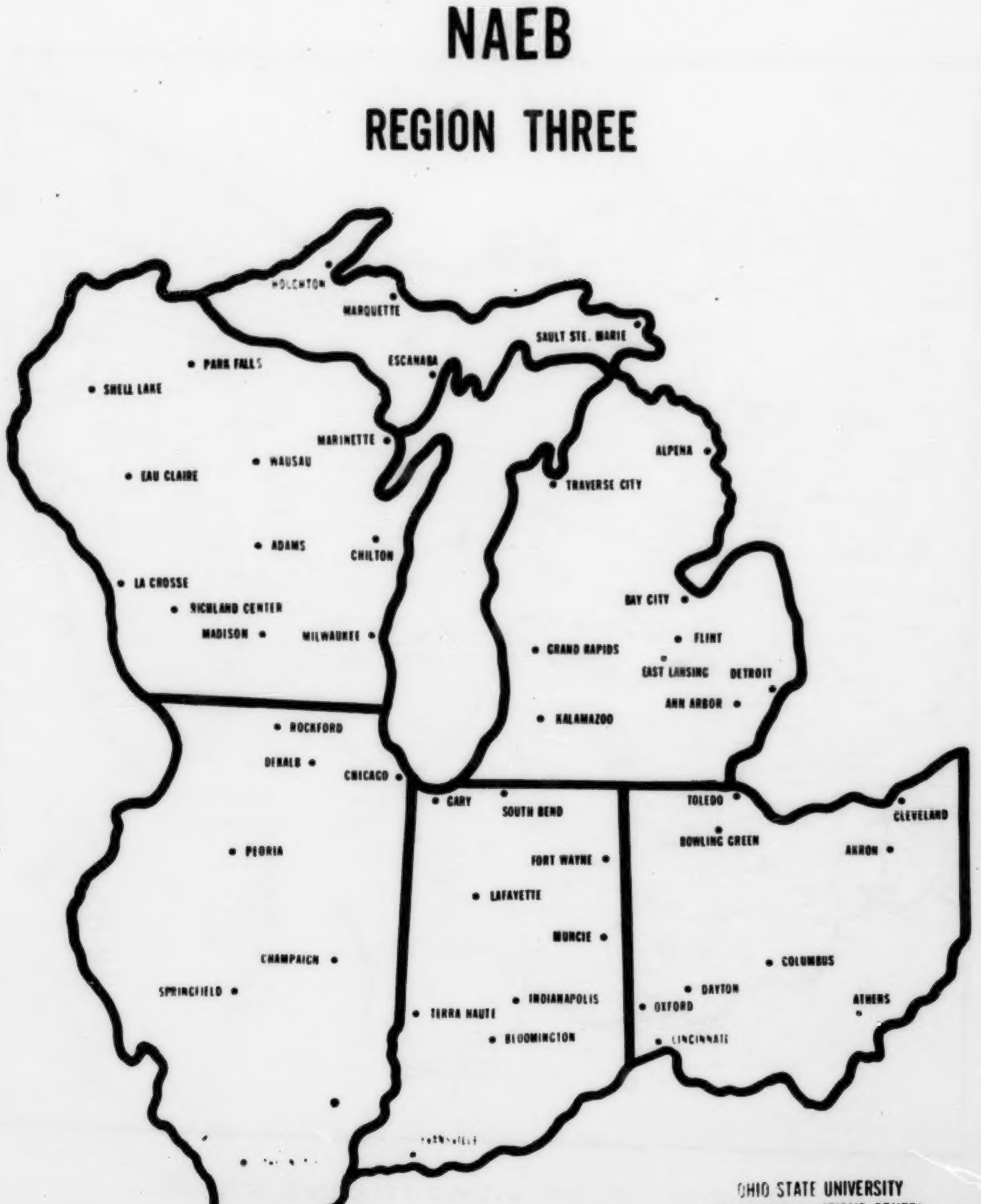
# 23 Great Falls
# 34 Williston
# 6 Minot
# 2 Grand Forks
MINNESOTA
11 Missoula
MONTANA
NORTH DAKOTA
# 27 Dickinson
# 34 Fargo
7 Butte
9 Bozeman
6 Miles City
11 Billings
# 10 Madison
Paul
Mpls
WISCONSIN
# 2 Chilton
SOUTH DAKOTA
# 8 Brookings
Eau Claire
La Crosse
# Vermillion
Sioux Falls
WYOMING
IOWA
Sioux City
# 5 Ames
Cedar Rapids
# 12 Iowa City
# 30 Davenport
NEBRASKA
# 8 Laramie
# 12 Lincoln
# 11 Des Moines
VHF's or UHF's now operating or incorporated
Reserved VHF's unused
Reserved UHF's unused

FIGURE IV - NORTH CENTRAL EDUCATIONAL TELEVISION NETWORK



MINNEAPOLIS-ST. PAUL
WISCONSIN
WAUSAU
MARINETTE
TRAVERSE CITY
EAU CLAIRE
GREEN BAY
CADILLAC
MICHIGAN
ROCHESTER
LA CROSSE
BAY CITY
SAGINAW
AUSTIN
MASON CITY
MADISON
MILWAUKEE
GRAND RAPIDS
EAST LANSING
LANSING
KALAMAZOO
DETROIT
WINDSOR
FORT DODGE
SIOUX CITY
WATERLOO
ROCKFORD
IOWA
AMES
CEDAR RAPIDS
CHICAGO
TOLEDO
DES MOINES
DAVENPORT
LA SALLE
ELKHART
OMAHA
ROCK ISLAND
FORT WAYNE
ROANOKE
AKRON
LINCOLN
PEORIA
LAFAYETTE
LIMA
OHIO
KIRKSVILLE
ILLINOIS
DANVILLE
MUNCIE
COLUMBUS
CHAMPAIGN
DECATUR
INDIANA
INDIANAPOLIS
QUINCY
ST. JOSEPH
SPRINGFIELD
DAYTON
HANNIBAL
TERRE HAUTE
CINCINNATI
TOPEKA
BLOOMINGTON
KANSAS CITY
COLUMBIA
SEDALIA
JEFFERSON CITY
LOUISVILLE
HUNTINGTON
MISSOURI
LEXINGTON
HARRISBURG
KENTUCKY
PITTSBURG
SPRINGFIELD
CAPE GIRARDEAU
JOPLIN
PADUCAH
BRISTOL
JOHNSON CITY

FIGURE V - MIDWESTERN EDUCATIONAL TELEVISION NETWORK



NAEB
REGION THREE
HOUGHTON
MARQUETTE
SAULT STE. MARIE
PARK FALLS
SHELL LAKE
ESCANABA
MARINETTE
WAUSAU
EAU CLAIRE
ALPENA
TRAVERSE CITY
ADAMS
CHILTON
LA CROSSE
RICHLAND CENTER
MADISON
MILWAUKEE
BAY CITY
FLINT
GRAND RAPIDS
EAST LANSING
DETROIT
ANN ARBOR
KALAMAZOO
ROCKFORD
DEKALB
CHICAGO
GARY
SOUTH BEND
TOLEDO
CLEVELAND
BOWLING GREEN
AKRON
PEORIA
FORT WAYNE
LAFAYETTE
MUNCIE
COLUMBUS
CHAMPAIGN
DAYTON
SPRINGFIELD
INDIANAPOLIS
OXFORD
ATHENS
TERRA HAUTE
BLOOMINGTON
CINCINNATI
EVANSVILLE
OHIO STATE UNIVERSITY
TELECOMMUNICATIONS CENTER

FIGURE VI - NAEB - REGION III

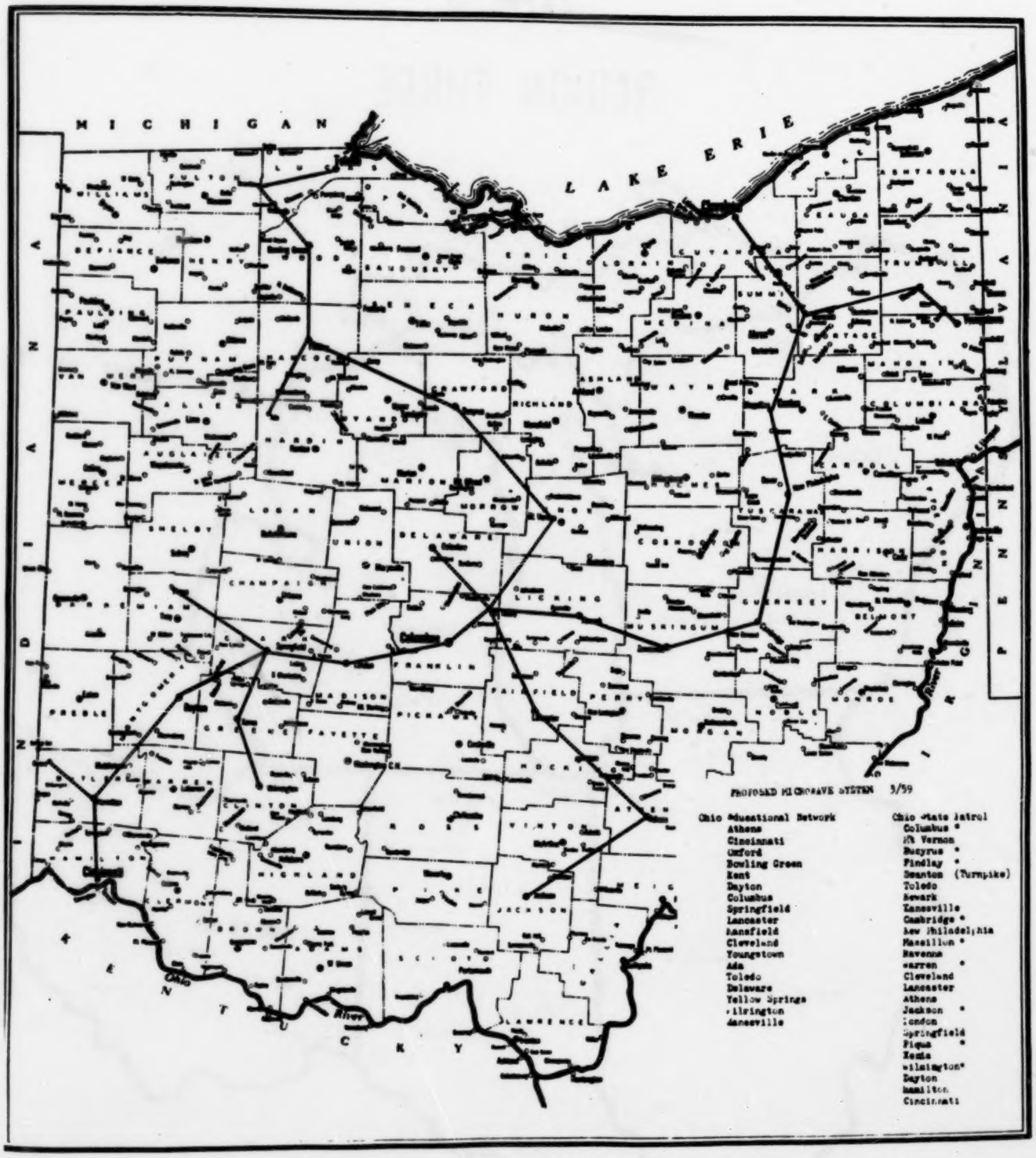

MICHIGAN
LAKE ERIE
INDIANA
PENNSYLVANIA
KENTUCKY
Ohio River
DEFIANCE
SANDUSKY
ERIE
HURON
CRAWFORD
RICHLAND
LOGAN
UNION
DELAWARE
CHAMPAIGN
LICKING
MUSKINGUM
GUERNSEY
BELMONT
MONROE
HARRISON
CARROLL
COSHOCTON
FRANKLIN
MADISON
FAIRFIELD
PERRY
MORGAN
HOCKING
VINTON
JACKSON
LAWRENCE
HIGHLAND
PREBLE
SHELBY
ASHTABULA
COLUMBIANA
SUMMIT
PORTAGE
MEDINA
PROPOSED MICROWAVE SYSTEM 3/59
Ohio Educational Network
Athens
Cincinnati
Oxford
Bowling Green
Kent
Dayton
Columbus
Springfield
Lancaster
Mansfield
Cleveland
Youngstown
Ada
Toledo
Delaware
Yellow Springs
Wilmington
Zanesville
Ohio State Patrol
Columbus *
Mt Vernon
Bucyrus *
Findlay *
Swanton (Turnpike)
Toledo
Newark
Zanesville
Cambridge *
New Philadelphia
Massillon *
Ravenna
Warren *
Cleveland
Lancaster
Athens
Jackson *
London
Springfield
Piqua *
Xenia
Wilmington*
Dayton
Hamilton
Cincinnati

FIGURE VII - OHIO EDUCATIONAL TELEVISION NETWORK

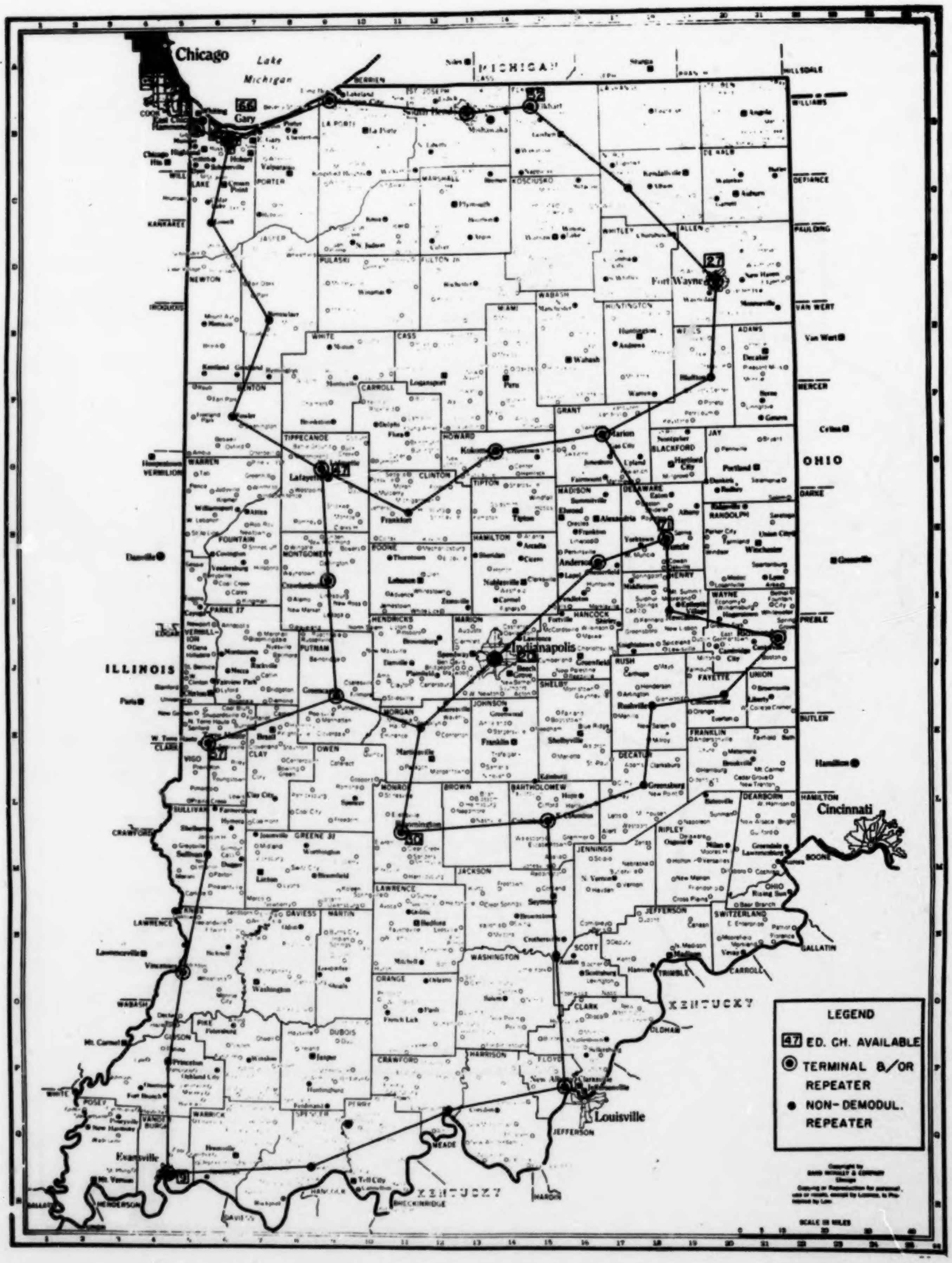

Chicago
Lake Michigan
Gary
66
MICHIGAN
52
South Bend
Fort Wayne
27
Lafayette
47
ILLINOIS
OHIO
Indianapolis
20
57
30
Cincinnati
KENTUCKY
Louisville
Evansville
LEGEND
47 ED. CH. AVAILABLE
◉ TERMINAL &/OR REPEATER
● NON-DEMODUL. REPEATER

FIGURE VIII - INDIANA EDUCATIONAL TELEVISION NETWORK

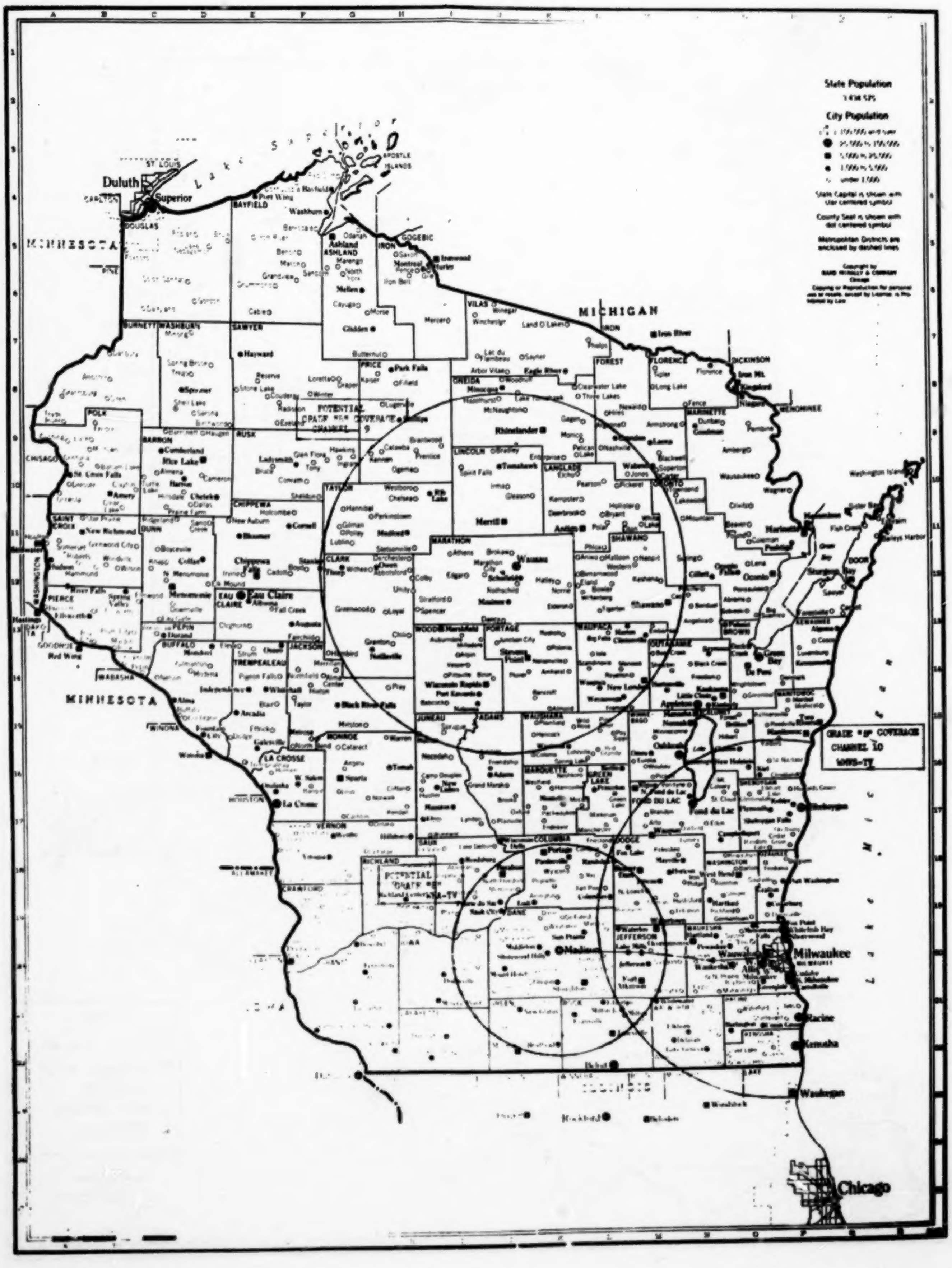
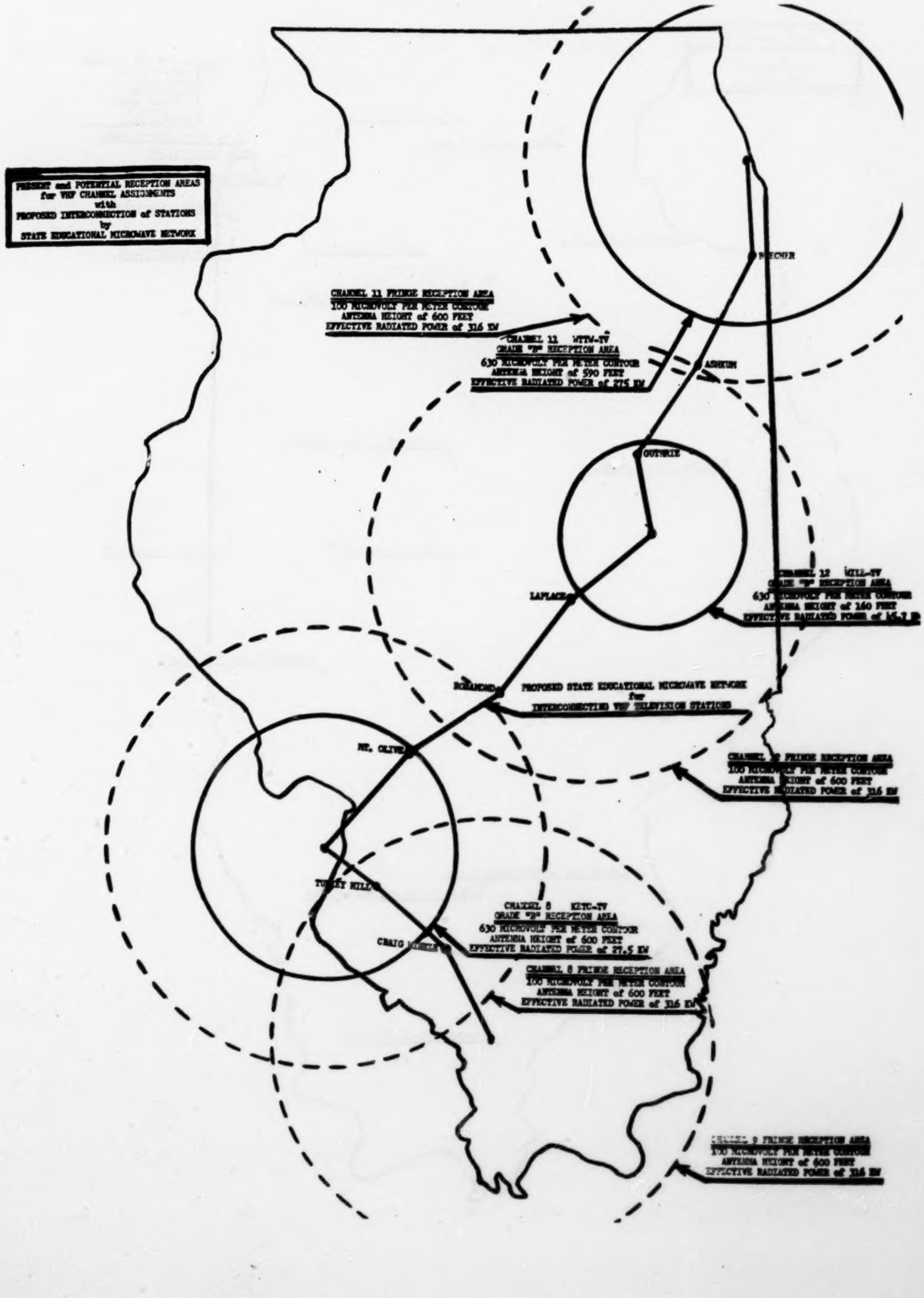

State Population
City Population
State Capital is shown with star centered symbol
County Seat is shown with dot centered symbol
Metropolitan Districts are enclosed by dashed lines
Copyright by RAND McNALLY & COMPANY Chicago
Lake Superior
APOSTLE ISLANDS
MINNESOTA
MICHIGAN
Duluth
Superior
Ashland
Rhinelander
Wausau
Eau Claire
La Crosse
Green Bay
Oshkosh
Madison
Milwaukee
Racine
Kenosha
Waukegan
Chicago
POTENTIAL GRADE "A" COVERAGE CHANNEL 9
POTENTIAL GRADE "A" WHA-TV
GRADE "A" COVERAGE CHANNEL 10 WMVS-TV

FIGURE IX - WISCONSIN EDUCATIONAL TELEVISION NETWORK



PRESENT and POTENTIAL RECEPTION AREAS
for VHF CHANNEL ASSIGNMENTS
with
PROPOSED INTERCONNECTION of STATIONS
by
STATE EDUCATIONAL MICROWAVE NETWORK

CHANNEL 11 FRINGE RECEPTION AREA
100 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW

CHANNEL 11 WTTW-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 590 FEET
EFFECTIVE RADIATED POWER of 275 KW

CHANNEL 12 WILL-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 160 FEET
EFFECTIVE RADIATED POWER of 15.7 KW

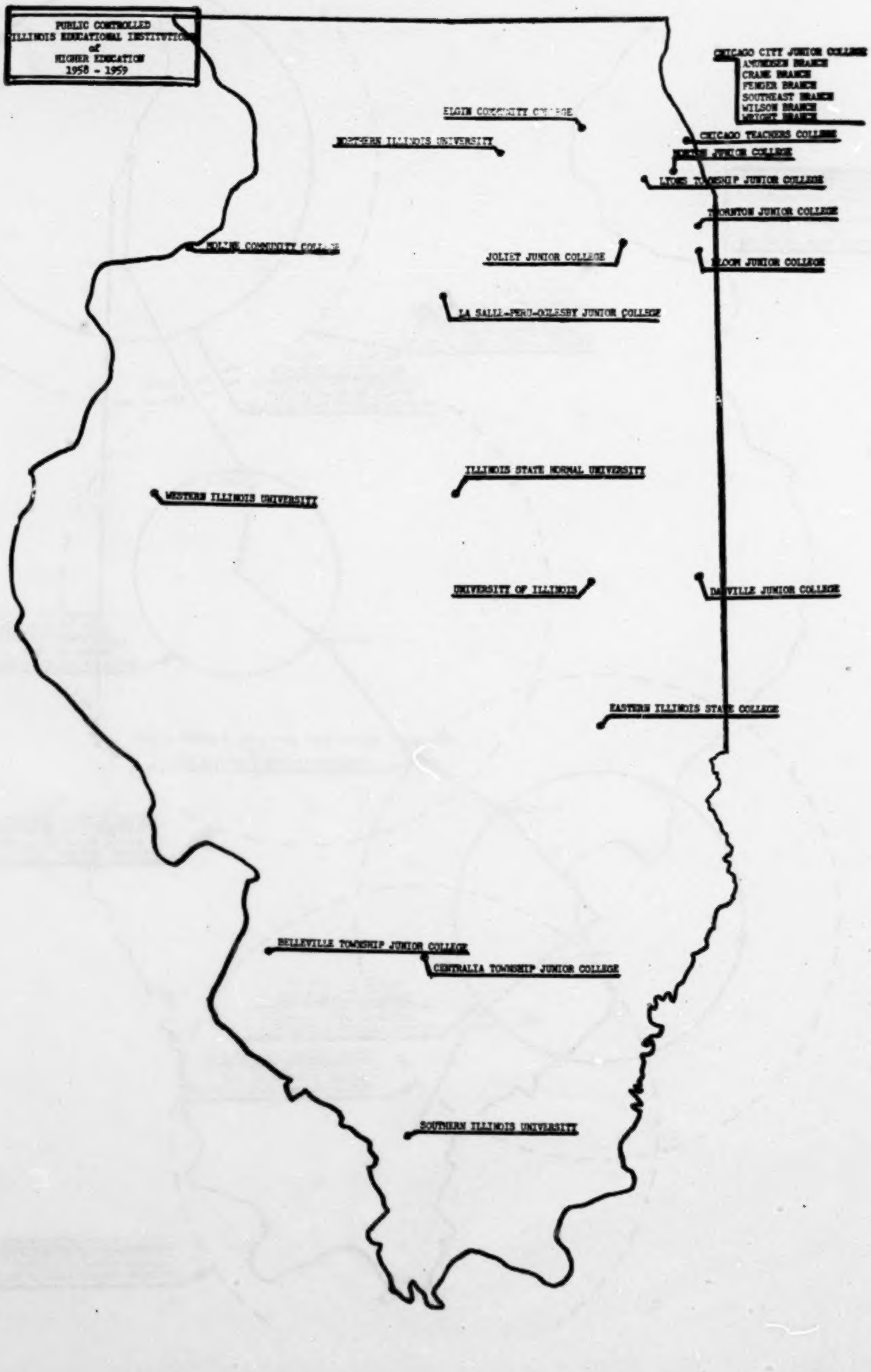
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK
for
INTERCONNECTING VHF TELEVISION STATIONS

CHANNEL 12 FRINGE RECEPTION AREA
100 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW

CHANNEL 8 KETC-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 27.5 KW

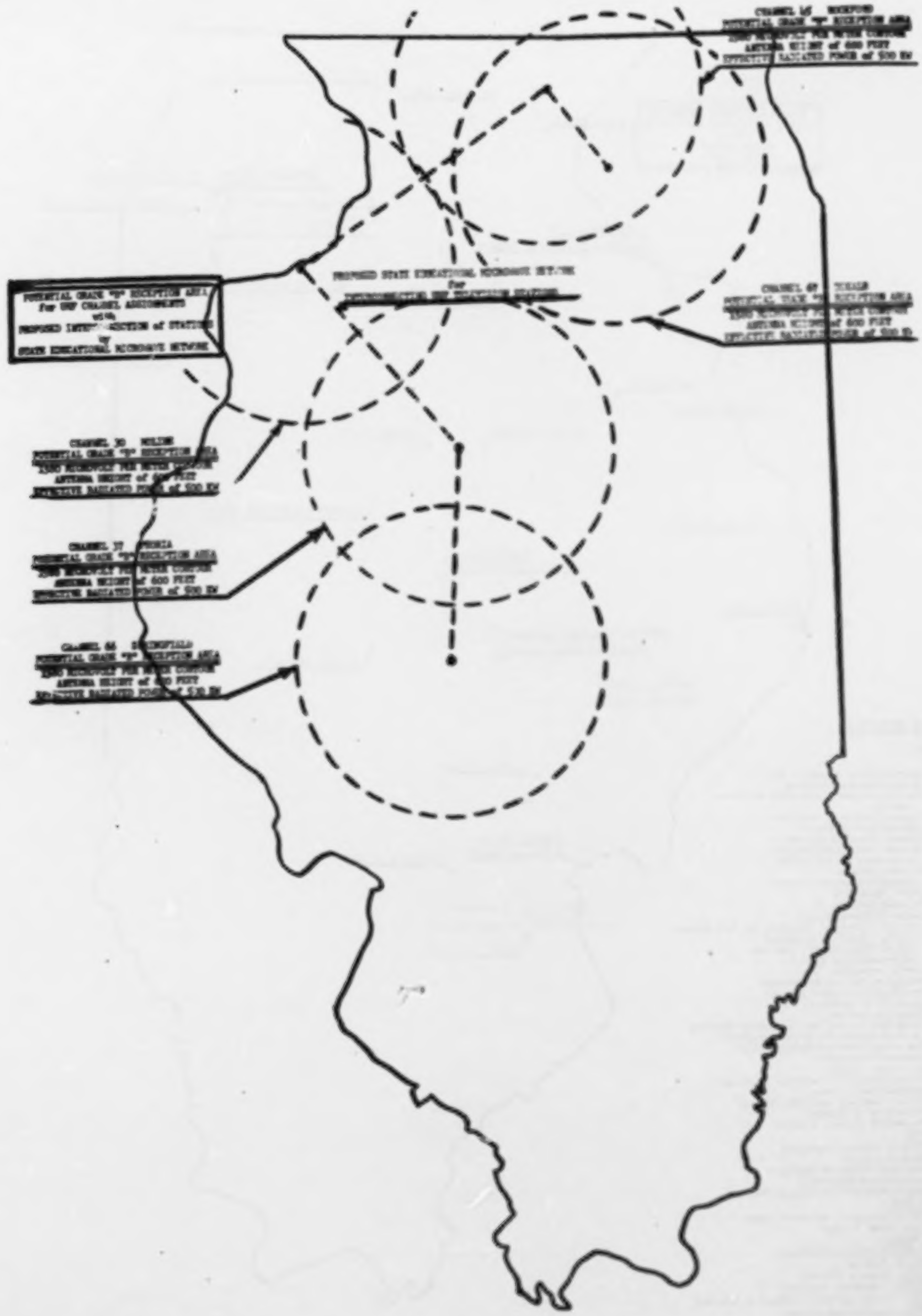
CHANNEL 8 FRINGE RECEPTION AREA
100 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW

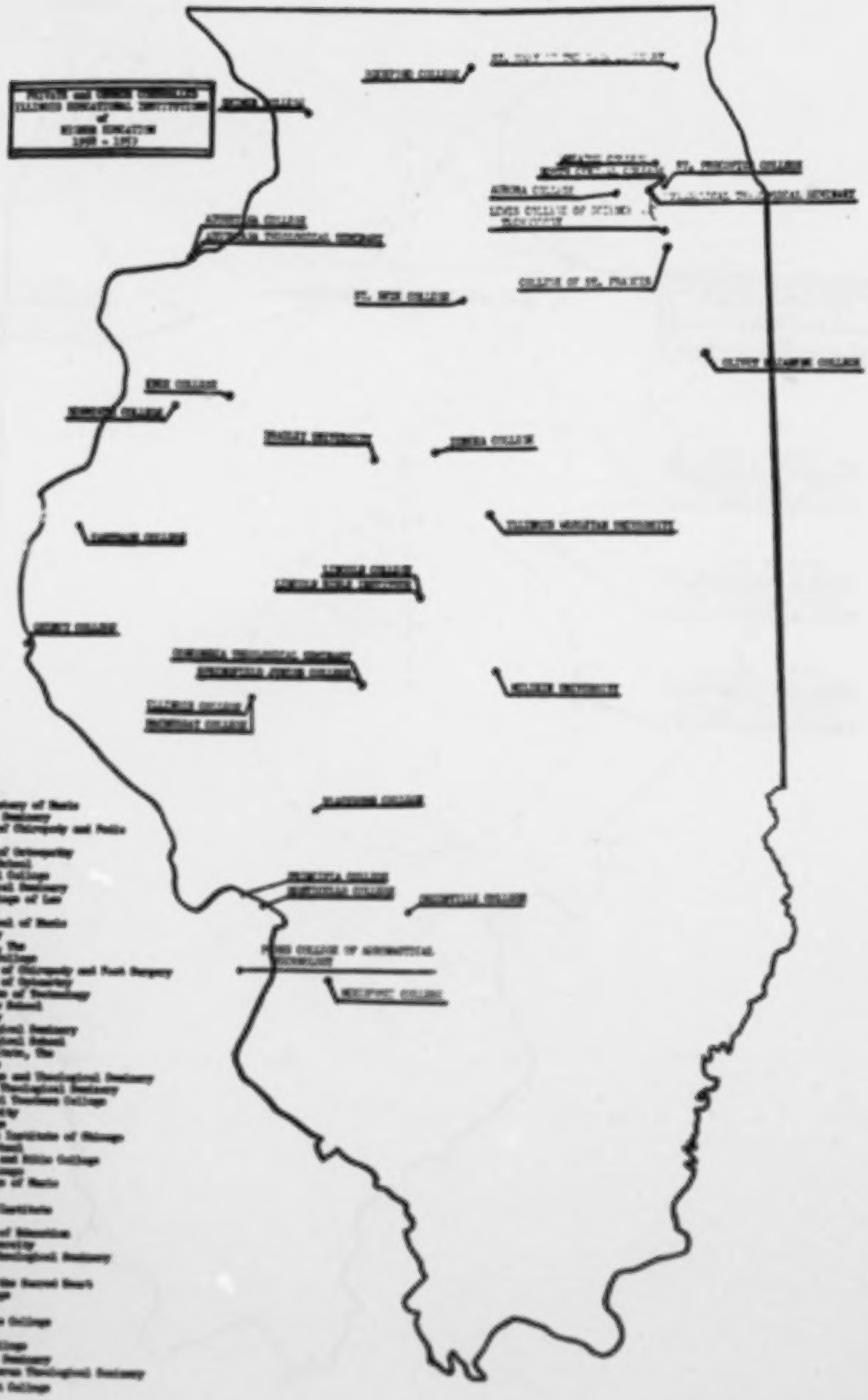
CHANNEL 9 FRINGE RECEPTION AREA
100 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW



PUBLIC CONTROLLED
ILLINOIS EDUCATIONAL INSTITUTION
of
HIGHER EDUCATION
1958 - 1959

CHICAGO CITY JUNIOR COLLEGE
AMUNDSEN BRANCH
CRANE BRANCH
FENGER BRANCH
SOUTHEAST BRANCH
WILSON BRANCH
WRIGHT BRANCH
ELGIN COMMUNITY COLLEGE
NORTHERN ILLINOIS UNIVERSITY
CHICAGO TEACHERS COLLEGE
MORTON JUNIOR COLLEGE
LYONS TOWNSHIP JUNIOR COLLEGE
THORNTON JUNIOR COLLEGE
MOLINE COMMUNITY COLLEGE
JOLIET JUNIOR COLLEGE
BLOOM JUNIOR COLLEGE
LA SALLE-PERU-OGLESBY JUNIOR COLLEGE
ILLINOIS STATE NORMAL UNIVERSITY
WESTERN ILLINOIS UNIVERSITY
UNIVERSITY OF ILLINOIS
DANVILLE JUNIOR COLLEGE
EASTERN ILLINOIS STATE COLLEGE
BELLEVILLE TOWNSHIP JUNIOR COLLEGE
CENTRALIA TOWNSHIP JUNIOR COLLEGE
SOUTHERN ILLINOIS UNIVERSITY


POTENTIAL GRADE "B" RECEPTION AREA
for UHF CHANNEL ASSIGNMENTS
with
PROPOSED INTERCONNECTION of STATIONS
by
STATE EDUCATIONAL MICROWAVE NETWORK
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK
for
INTERCONNECTING UHF TELEVISION STATIONS
CHANNEL 16 ROCKFORD
POTENTIAL GRADE "B" RECEPTION AREA
2000 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
CHANNEL 67 [illegible]
POTENTIAL GRADE "B" RECEPTION AREA
2000 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
CHANNEL 30 MOLINE
POTENTIAL GRADE "B" RECEPTION AREA
2000 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
CHANNEL 37 PEORIA
POTENTIAL GRADE "B" RECEPTION AREA
2000 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
CHANNEL 66 SPRINGFIELD
POTENTIAL GRADE "B" RECEPTION AREA
2000 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW


PRIVATE AND CHURCH CONTROLLED
ILLINOIS EDUCATIONAL INSTITUTIONS
of
HIGHER EDUCATION
[illegible]
ROCKFORD COLLEGE
ST. MARY OF THE LAKE SEMINARY
SHIMER COLLEGE
WHEATON COLLEGE
NORTH CENTRAL COLLEGE
ST. PROCOPIUS COLLEGE
AURORA COLLEGE
EVANGELICAL THEOLOGICAL SEMINARY
LEWIS COLLEGE OF SCIENCE AND TECHNOLOGY
AUGUSTANA COLLEGE
AUGUSTANA THEOLOGICAL SEMINARY
COLLEGE OF ST. FRANCIS
ST. BEDE COLLEGE
OLIVET NAZARENE COLLEGE
KNOX COLLEGE
MONMOUTH COLLEGE
BRADLEY UNIVERSITY
EUREKA COLLEGE
ILLINOIS WESLEYAN UNIVERSITY
CARTHAGE COLLEGE
LINCOLN COLLEGE
LINCOLN BIBLE INSTITUTE
QUINCY COLLEGE
CONCORDIA THEOLOGICAL SEMINARY
SPRINGFIELD JUNIOR COLLEGE
MILLIKIN UNIVERSITY
ILLINOIS COLLEGE
MACMURRAY COLLEGE
BLACKBURN COLLEGE
PRINCIPIA COLLEGE
SHURTLEFF COLLEGE
GREENVILLE COLLEGE
PARKS COLLEGE OF AERONAUTICAL TECHNOLOGY
McKENDREE COLLEGE

PRIVATE INSTITUTIONS

CHICAGO

American Conservatory of Music
Bethany Biblical Seminary
Chicago College of Chiropody and Pedic Surgery
Chicago College of Osteopathy
Chicago Medical School
Chicago Technical College
Chicago Theological Seminary
Chicago-Kent College of Law
Columbia College
Cosmopolitan School of Music
DePaul University
Felician College, The
George Williams College
Illinois College of Chiropody and Foot Surgery
Illinois College of Optometry
Illinois Institute of Technology
John Marshall Law School
Loyola University
McCormick Theological Seminary
Meadville Theological School
Moody Bible Institute, The
Mundelein College
North Park College and Theological Seminary
Northern Baptist Theological Seminary
Pestalozzi Froebel Teachers College
Roosevelt University
St. Xavier College
School of the Art Institute of Chicago
Sherwood Music School
Trinity Seminary and Bible College
University of Chicago
VanderCook College of Music

EVANSTON

Garrett Biblical Institute
Kendall College
National College of Education
Northwestern University
Seabury-Western Theological Seminary

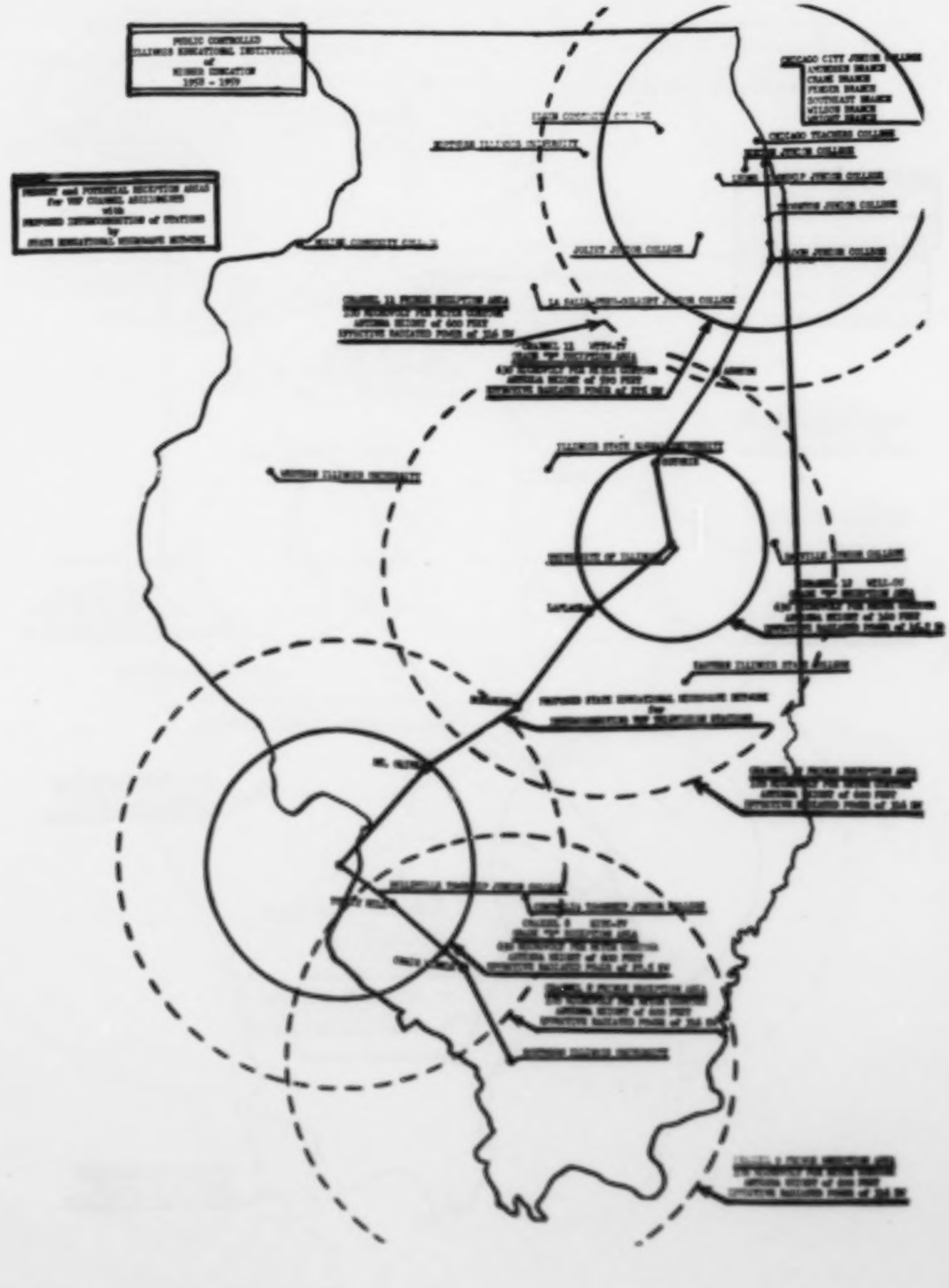
LAKE FOREST

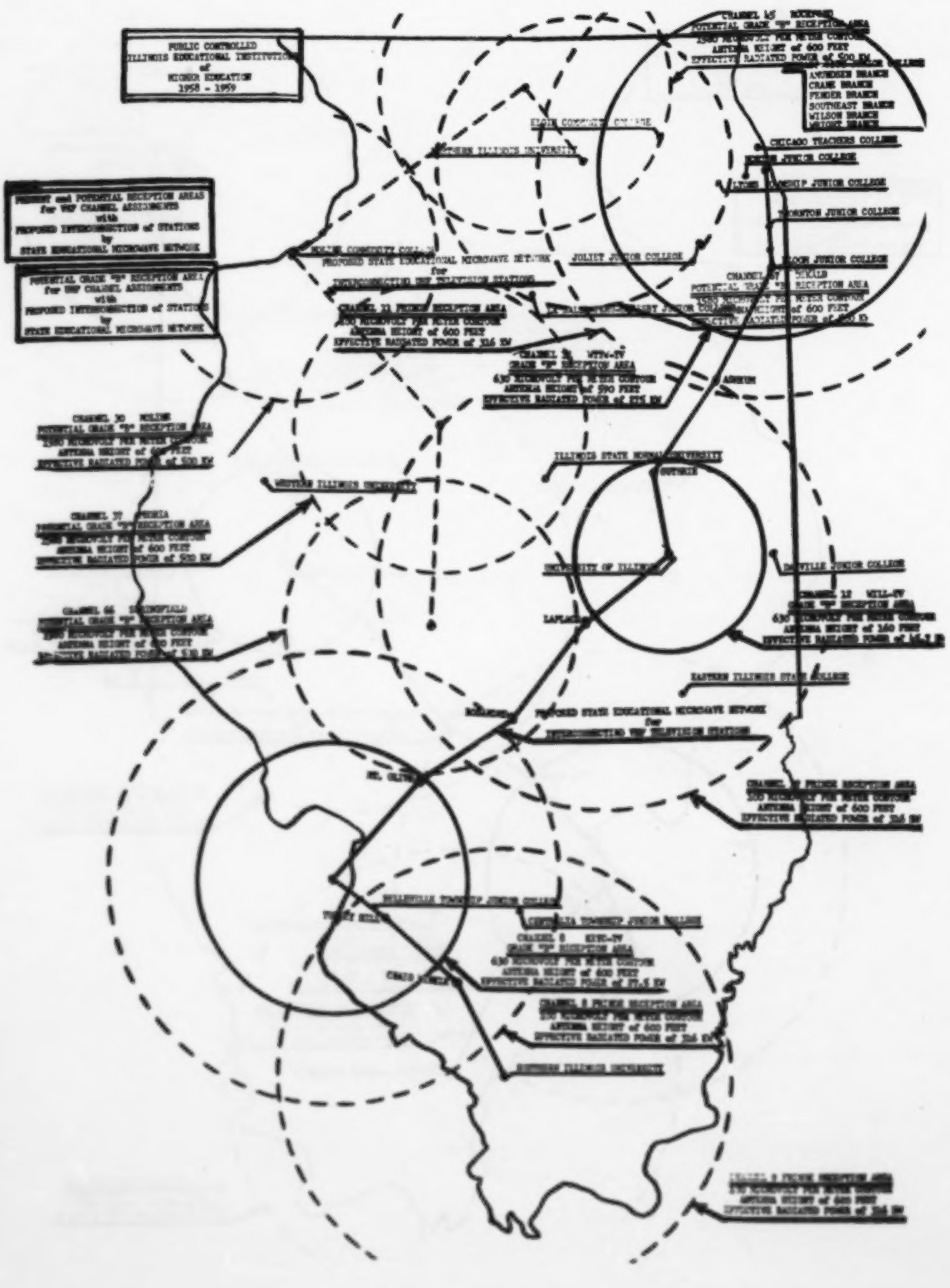
Barat College of the Sacred Heart
Lake Forest College

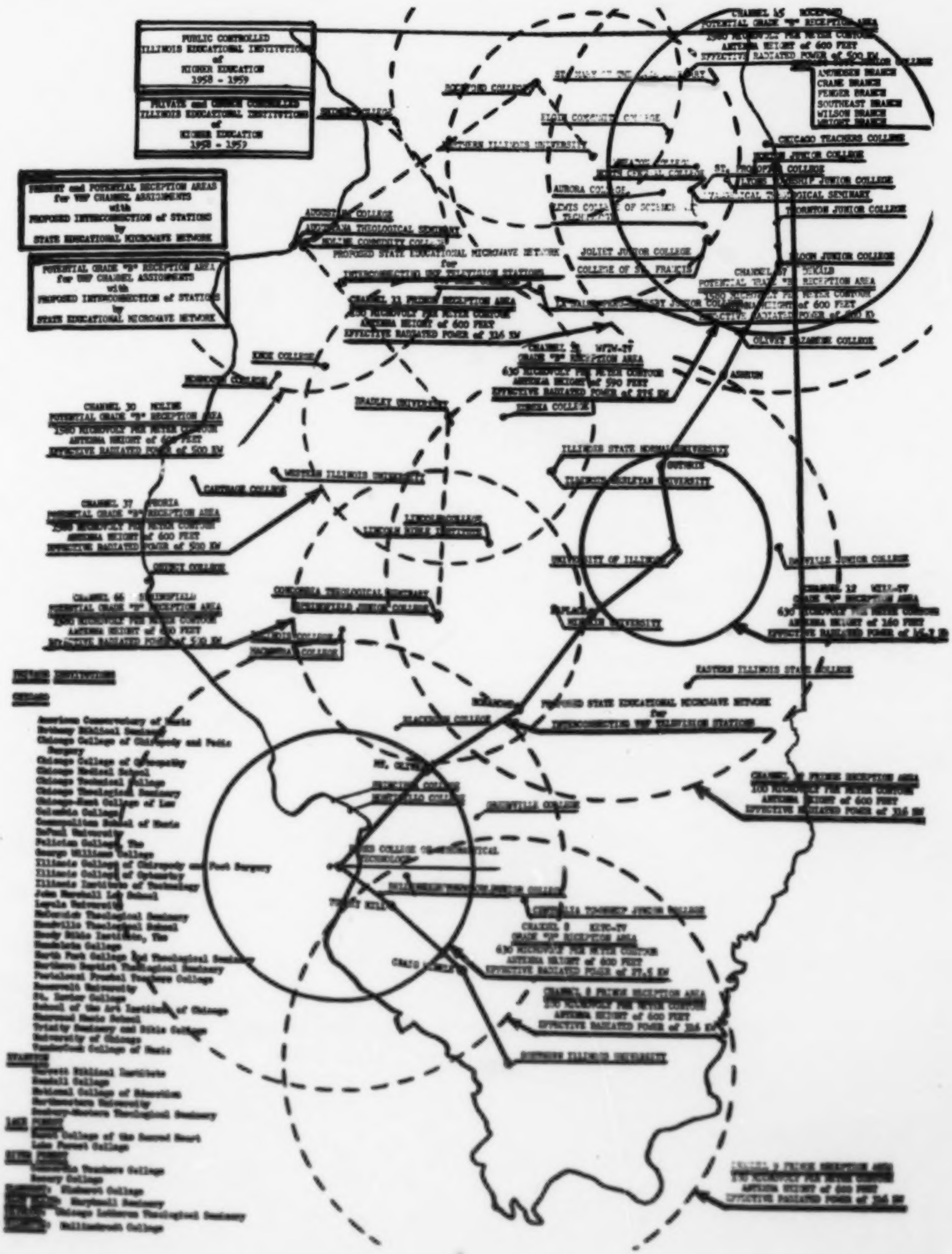
RIVER FOREST

Concordia Teachers College
Rosary College

ELMHURST: Elmhurst College
[illegible]: Maryknoll Seminary
MAYWOOD: Chicago Lutheran Theological Seminary
[illegible]: [illegible] College


PUBLIC CONTROLLED
ILLINOIS EDUCATIONAL INSTITUTIONS
of
HIGHER EDUCATION
1958 - 1959
PRESENT and POTENTIAL RECEPTION AREAS
for TV CHANNEL ASSIGNMENTS
with
PROPOSED INTERCONNECTION of STATIONS
by
STATE EDUCATIONAL MICROWAVE NETWORK
CHICAGO CITY JUNIOR COLLEGE
AMUNDSEN BRANCH
CRANE BRANCH
FENGER BRANCH
SOUTHEAST BRANCH
WILSON BRANCH
WRIGHT BRANCH
CHICAGO TEACHERS COLLEGE
LYONS TOWNSHIP JUNIOR COLLEGE
THORNTON JUNIOR COLLEGE
JOLIET JUNIOR COLLEGE
ELGIN COMMUNITY COLLEGE
NORTHERN ILLINOIS UNIVERSITY
LA SALLE-PERU-OGLESBY JUNIOR COLLEGE
CHANNEL 11
ANTENNA HEIGHT of 600 FEET
WESTERN ILLINOIS UNIVERSITY
ILLINOIS STATE NORMAL UNIVERSITY
UNIVERSITY OF ILLINOIS
DANVILLE JUNIOR COLLEGE
CHANNEL 12
EASTERN ILLINOIS STATE COLLEGE
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK
for
BELLEVILLE TOWNSHIP JUNIOR COLLEGE
CENTRALIA TOWNSHIP JUNIOR COLLEGE
CHANNEL 8
ANTENNA HEIGHT of 600 FEET
SOUTHERN ILLINOIS UNIVERSITY


PUBLIC CONTROLLED
ILLINOIS EDUCATIONAL INSTITUTIONS
of
HIGHER EDUCATION
1958 - 1959
PRESENT and POTENTIAL RECEPTION AREAS
for VHF CHANNEL ASSIGNMENTS
with
PROPOSED INTERCONNECTION of STATIONS
by
STATE EDUCATIONAL MICROWAVE NETWORK
POTENTIAL GRADE "B" RECEPTION AREA
for UHF CHANNEL ASSIGNMENTS
with
PROPOSED INTERCONNECTION of STATIONS
by
STATE EDUCATIONAL MICROWAVE NETWORK
CHANNEL 45 ROCKFORD
POTENTIAL GRADE "B" RECEPTION AREA
1580 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
AMUNDSEN BRANCH
CRANE BRANCH
FENGER BRANCH
SOUTHEAST BRANCH
WILSON BRANCH
WRIGHT BRANCH
ELGIN COMMUNITY COLLEGE
NORTHERN ILLINOIS UNIVERSITY
CHICAGO TEACHERS COLLEGE
JUNIOR COLLEGE
THORNTON JUNIOR COLLEGE
MOLINE COMMUNITY COLLEGE
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK
for
INTERCONNECTING UHF TELEVISION STATIONS
JOLIET JUNIOR COLLEGE
BLOOM JUNIOR COLLEGE
CHANNEL 67 DEKALB
POTENTIAL GRADE "B" RECEPTION AREA
ANTENNA HEIGHT of 600 FEET
CHANNEL 11 FRINGE RECEPTION AREA
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW
CHANNEL WTTW-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 590 FEET
ASHKUM
CHANNEL 30 MOLINE
POTENTIAL GRADE "B" RECEPTION AREA
1580 MICROVOLT PER METER CONTOUR
EFFECTIVE RADIATED POWER of 500 KW
ILLINOIS STATE NORMAL UNIVERSITY
GUTHRIE
WESTERN ILLINOIS UNIVERSITY
CHANNEL 37 PEORIA
POTENTIAL GRADE "B" RECEPTION AREA
1580 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 500 KW
UNIVERSITY OF ILLINOIS
DANVILLE JUNIOR COLLEGE
CHANNEL 12 WILL-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 160 FEET
CHANNEL 66 SPRINGFIELD
POTENTIAL GRADE "B" RECEPTION AREA
1580 MICROVOLT PER METER CONTOUR
LAPLACE
EASTERN ILLINOIS STATE COLLEGE
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK
for
INTERCONNECTING VHF TELEVISION STATIONS
MT. OLIVE
CHANNEL FRINGE RECEPTION AREA
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW
BELLEVILLE TOWNSHIP JUNIOR COLLEGE
CENTRALIA TOWNSHIP JUNIOR COLLEGE
CHANNEL 8 KETC-TV
GRADE "B" RECEPTION AREA
630 MICROVOLT PER METER CONTOUR
ANTENNA HEIGHT of 600 FEET
CHANNEL 8 FRINGE RECEPTION AREA
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW
SOUTHERN ILLINOIS UNIVERSITY
CHANNEL 8 FRINGE RECEPTION AREA
ANTENNA HEIGHT of 600 FEET
EFFECTIVE RADIATED POWER of 316 KW


PUBLIC CONTROLLED ILLINOIS EDUCATIONAL INSTITUTIONS of HIGHER EDUCATION 1958 - 1959
PRIVATE and CHURCH CONTROLLED ILLINOIS EDUCATIONAL INSTITUTIONS of HIGHER EDUCATION 1958 - 1959
PRESENT and POTENTIAL RECEPTION AREAS for UHF CHANNEL ASSIGNMENTS with PROPOSED INTERCONNECTION of STATIONS by STATE EDUCATIONAL MICROWAVE NETWORK
POTENTIAL GRADE "B" RECEPTION AREA for UHF CHANNEL ASSIGNMENTS with PROPOSED INTERCONNECTION of STATIONS by STATE EDUCATIONAL MICROWAVE NETWORK
CHANNEL 45 ROCKFORD POTENTIAL GRADE "B" RECEPTION AREA 1500 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 500 KW
CHICAGO JUNIOR COLLEGE
AMUNDSEN BRANCH
CRANE BRANCH
FENGER BRANCH
SOUTHEAST BRANCH
WILSON BRANCH
WRIGHT BRANCH
CHICAGO TEACHERS COLLEGE
MORTON JUNIOR COLLEGE
ST. PROCOPIUS COLLEGE
LYONS TOWNSHIP JUNIOR COLLEGE
EVANGELICAL THEOLOGICAL SEMINARY
THORNTON JUNIOR COLLEGE
ELGIN JUNIOR COLLEGE
CHANNEL 57 DEKALB POTENTIAL GRADE "B" RECEPTION AREA 1500 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 500 KW
OLIVET NAZARENE COLLEGE
ST. MARY OF THE LAKE SEMINARY
ROCKFORD COLLEGE
ELGIN COMMUNITY COLLEGE
NORTHERN ILLINOIS UNIVERSITY
WHEATON COLLEGE
NORTH CENTRAL COLLEGE
AURORA COLLEGE
LEWIS COLLEGE OF SCIENCE AND TECHNOLOGY
JOLIET JUNIOR COLLEGE
COLLEGE OF ST. FRANCIS
LASALLE-PERU-OGLESBY JUNIOR COLLEGE
SHIMER COLLEGE
AUGUSTANA COLLEGE
AUGUSTANA THEOLOGICAL SEMINARY
MOLINE COMMUNITY COLLEGE
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK for INTERCONNECTING UHF TELEVISION STATIONS
CHANNEL 31 FRINGE RECEPTION AREA 100 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 316 KW
CHANNEL 21 WTVW-TV GRADE "B" RECEPTION AREA 630 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 590 FEET EFFECTIVE RADIATED POWER of 275 KW
ASHKUM
EUREKA COLLEGE
KNOX COLLEGE
MONMOUTH COLLEGE
BRADLEY UNIVERSITY
CHANNEL 30 MOLINE POTENTIAL GRADE "B" RECEPTION AREA 1500 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 500 KW
ILLINOIS STATE NORMAL UNIVERSITY
GOTHRIE
ILLINOIS WESLEYAN UNIVERSITY
WESTERN ILLINOIS UNIVERSITY
CARTHAGE COLLEGE
CHANNEL 37 PEORIA POTENTIAL GRADE "B" RECEPTION AREA 1500 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 500 KW
LINCOLN COLLEGE
LINCOLN BIBLE INSTITUTE
UNIVERSITY OF ILLINOIS
DANVILLE JUNIOR COLLEGE
QUINCY COLLEGE
CHANNEL 66 SPRINGFIELD POTENTIAL GRADE "B" RECEPTION AREA 1500 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 500 KW
CONCORDIA THEOLOGICAL SEMINARY
SPRINGFIELD JUNIOR COLLEGE
ILLINOIS COLLEGE
MACMURRAY COLLEGE
DEPLACE
MILLIKIN UNIVERSITY
CHANNEL 12 WILL-TV GRADE "B" RECEPTION AREA 630 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 160 FEET EFFECTIVE RADIATED POWER of 16.2 KW
EASTERN ILLINOIS STATE COLLEGE
ROSAMOND
PROPOSED STATE EDUCATIONAL MICROWAVE NETWORK for INTERCONNECTING UHF TELEVISION STATIONS
BLACKBURN COLLEGE
MT. OLIVE
PRINCIPIA COLLEGE
MONTICELLO COLLEGE
GREENVILLE COLLEGE
CHANNEL 20 FRINGE RECEPTION AREA 100 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 316 KW
PARKS COLLEGE OF AERONAUTICAL TECHNOLOGY
BELLEVILLE TOWNSHIP JUNIOR COLLEGE
CENTRALIA TOWNSHIP JUNIOR COLLEGE
TURKEY HILL
CHANNEL 8 KETC-TV GRADE "B" RECEPTION AREA 630 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 77.5 KW
CRAIG
CHANNEL 8 FRINGE RECEPTION AREA 100 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 316 KW
SOUTHERN ILLINOIS UNIVERSITY
CHANNEL 8 FRINGE RECEPTION AREA 100 MICROVOLT PER METER CONTOUR ANTENNA HEIGHT of 600 FEET EFFECTIVE RADIATED POWER of 316 KW
PRIVATE INSTITUTIONS
CHICAGO
American Conservatory of Music
Bethany Biblical Seminary
Chicago College of Chiropody and Pedic Surgery
Chicago College of Osteopathy
Chicago Medical School
Chicago Technical College
Chicago Theological Seminary
Chicago-Kent College of Law
Columbia College
Cosmopolitan School of Music
DePaul University
Felician College, The
George Williams College
Illinois College of Chiropody and Foot Surgery
Illinois College of Optometry
Illinois Institute of Technology
John Marshall Law School
Loyola University
McCormick Theological Seminary
Meadville Theological School
Moody Bible Institute, The
Mundelein College
North Park College and Theological Seminary
Northern Baptist Theological Seminary
Pestalozzi Froebel Teachers College
Roosevelt University
St. Xavier College
School of the Art Institute of Chicago
Sherwood Music School
Trinity Seminary and Bible College
University of Chicago
Vandercook College of Music
EVANSTON
Garrett Biblical Institute
Kendall College
National College of Education
Northwestern University
Seabury-Western Theological Seminary
LAKE FOREST
Barat College of the Sacred Heart
Lake Forest College
RIVER FOREST
Concordia Teachers College
Rosary College
ELMHURST: Elmhurst College
GLEN ELLYN: Maryknoll Seminary
MAYWOOD: Chicago Lutheran Theological Seminary
WILMETTE: Mallinckrodt College

For the State of Illinois, a more thorough analysis has been made by the author. The study assumes the eventual interconnection of the VHF broadcast stations assigned to Illinois by the FCC and also the establishment of a UHF microwave network interconnecting the UHF broadcast stations assigned to Illinois. Map overlays have been prepared to illustrate the potential coverage of a VHF network (map overlay #1) and a UHF network (map overlay #3). The study was made for public-controlled Illinois educational institutions of higher education (map overlay #2) and private and church-controlled Illinois educational institutions of higher education (map overlay #4).

Viewing map overlay #1, it is apparent that the four assigned VHF channels do not adequately cover all areas of Illinois even when operated at their maximum effective power. By combining map overlays #1 and #2 public-controlled institutions of Moline Community College, LaSalle-Peru-Oglesby Junior College, and Western Illinois University are not in the VHF broadcast coverage area. If map overlays #1, #2, and #3 are superimposed, Western Illinois University is the only public-controlled instituion of higher education not within a potential broadcast coverage area. Also, only two relatively small areas of the state do not lie within the combined VHF-UHF coverage area. One of these areas is in the southeast portion of the state and is centered around Olney, Illinois. The other is in the western portion of the state and is centered around Augusta, Illinois.

By combining the four map overlays of the state it becomes apparent that only a few institutions of higher education fall outside the combined broadcast coverage of a VHF-UHF microwave network. Where coverage is desirable in other areas, common-carrier microwave equipment or translator equipment may be employed.

Although this discussion is centered about the higher educational institutions of Illinois, the study is equally applicable to the elementary and high school levels of instruction.

To assist the layman in evaluating the costs associated with the establishment of a microwave network, the approximate costs are tabulated in Table II. Costs have been determined for a one-way microwave system and a two-way microwave system. By using the data of Table II and employing an average mileage separation of thirty miles between relay sites, the cost determination of the complete microwave network is a relatively simple matter.

A typical analysis of the capital investment and installation charges for a two-way microwave relay station is tabulated in Table III. The unit charges employed in Table III are rough estimates obtained from several manufacturers.

In order to make a technical evaluation of a microwave path it is first necessary to make a study of the terrain between relay sites and also a preliminary selection of transmitting, receiving and antenna equipment. When the initial study for a given path is completed, a form similar to Table IV may be employed as a guide in determining the signal-to-noise ratio. The signal-to-noise ratio of each relay in the system is the ultimate criterion as to the practicality of any given microwave path.

Much valuable material has been prepared and published to assist the less experienced engineers in making an accurate evaluation of a microwave path. The reference material in the appendix has been selected as being most useful for a lay evaluation.

As is usually the case in a presentation of this nature it is always difficult to give adequate treatment to the subject matter. The material presented herein has

been assembled not as an authoritative study but rather as an accumulation of the planning and thinking that is now taking place in a number of the regions of the United States where the potential of educational television is being demonstrated.

TABLE I

NAEB - REGION III

ENGINEERING MICROWAVE COMMITTEE

CHAIRMAN - Walter B. Emery
Co-Chairman - Duane M. Weise

TELEVISION REPRESENTATIVES

Illinois - Duane M. Weise, WTTW, Chicago
Indiana - Ralph Townsley, WBAA, Purdue
Michigan - Fred Remley, University of Michigan
Ohio - Harold Gorsuch, WOSU, Columbus
Wisconsin - James Wulliman, WMVS, Milwaukee

AM-FM REPRESENTATIVES

Illinois - Robert Belden, WILL, Urbana
Indiana - Elmer Sulzer, WTTV, Bloomington
Michigan - John Blakeslee, WOSU, Columbus
Wisconsin - John Stiehl, WHA, Madison

OTHER REPRESENTATIVES

Cy Braum - Joint Council on Educational Television

TABLE II

CAPITAL INVESTMENT REQUIREMENT FOR MICROWAVE SYSTEMS

One-Way Microwave System

Initial Transmitting Terminal. . . .	$22,000
Relay or Repeater Station.	37,500
Final Receiving Terminal	22,000

Two-Way Microwave System

Initial Transmitting Terminal. . . .	$30,000
Relay or Repeater Station.	50,000
Final Receiving Terminal	30,000

TABLE III

Capital Investment and Installation Charges
For
Microwave Station Beecher

QUANTITY	DESCRIPTION	ESTIMATED UNIT CHARGE	ESTIMATED TOTAL CHARGE
	Basic Property Investment		
1	Land - 1/2 Acre	$1,000	$ 1,000
1	Building - 8' x 12' x 8'	2,500	2,500
1	Emergency Power	500	500
	Tower Investment		
	Tower and Installation		
	100 ft	$3,000	
	150 ft	4,000	
	200 ft	5,000	
1	250 ft	6,500	6,500
	300 ft	8,000	
1	Tower Piers	1,500	1,500
	Tower Lighting Installed		
	100 ft	500	
	150 ft	600	
	200 ft	700	
1	250 ft	750	750
	300 ft	800	
	Antenna System		
	Tower Top Reflector		
	6' x 8'	450	
2	8' x 12'	600	1,200
	10' x 15'	1,000	
	Parabolic Antenna		
2	4 ft	$ 300	600
	6 ft	550	
	Radome		
2	4 ft	100	200
	6 ft	175	
	Antenna Heater		
2	4' dish	$ 190	380
	6' dish	260	
	Antenna Roof Mount		
2	4' & 6'	$ 100	200
4	Waveguide System	100	400
2	Pressurization System	50	100
2	Duplexer	600	1,200
	Technical Equipment Investment		
2	1.0 Watt Microwave Rec.-Trans.	$12,000	$24,000
2	Equipment Racks	60	120
1	Test Attenuator	50	50
2	Spare Parts	500	1,000
2	Spare Tubes	500	1,000
1	Test Equipment	1,000	1,000
2	Automatic Carrier Interrupter	400	800
1	Dual Sound Diplexing	1,000	1,000
	Miscellaneous Charges		
1	Local Construction & License Fees	500	500
1	Power Line Connection	150	150
	Estimated Investment		$46,650
	10% Contingency		4,665
	Estimated Total Investment		$51,315

TABLE IV

DETERMINATION OF MICROWAVE $S/N_{\frac{pp}{rms}}$

Hop: Beecher to Ashkum

	Beecher		Ashkum	
Latitude:	41° 22' 0"		40° 53' 58"	
Longitude:	87° 37' 18"		87° 51' 50"	
Feet above Sea Level:	750	Ft	660	Ft
Feet above Ground:	250	Ft	300	Ft
Mileage Separation:			36	Miles
Min. Clearance (Std. Earth Profile):			110	Feet
Req'd. .6 First Fresnel Clearance Zone:			48	Feet
Allowance for Trees & Buildings:			62	Feet
Frequency of Operation:			7000	Mc.

Type of Equipment: Raytheon KTR-1000 G

Free Space Path Loss:	$A =$	-144	db		
Transmitter Power:	$P_t =$	30	dbm	1.0	Watts
Transmitter Parabolic Antenna Gain:	$G_{t1} =$	37	db	4	Feet
Transmitter Tower Top Reflector Gain	$G_{t2} =$	0	db	8 x 12	Feet
Receiver Parabolic Antenna Gain:	$G_{r1} =$	37	db	4	Feet
Receiver Tower Reflector Gain:	$G_{r2} =$	0	db	8 x 12	Feet
Receiver Noise Power:	$N_r =$	-87	dbm		

$$\frac{\text{Microwave Carrier}}{\text{Microwave Noise}_{\frac{rms}{rms}}} = \frac{P_t + G_{t1} + G_{t2} + A + G_{r2} + G_{r1}}{N_r}\ \text{db}$$

$$\frac{C}{N}_{\frac{rms}{rms}} = \frac{-39}{-87}\ \text{db} = 48\ \text{db}$$

$$\text{Video Signal}_{\frac{pp}{rms}} = \frac{C}{N_{\frac{rms}{rms}}} + 5.9\ \text{db}_{am} - 1.9\ \text{db}_{fm} + \underset{\text{emphasis}}{2.5\text{db}} + 9\ \text{db}_{rms} \overset{-6\ \text{db}}{\text{misc.losses}}$$

for Raytheon KTR-1000 G

$$\frac{S}{N_{\frac{pp}{rms}}} = \frac{C}{N_{\frac{rms}{rms}}} + 9.5\ \text{db} = 48 + 9.5\text{db} = 57.5\ \text{db}$$

$$\frac{\text{Audio Signal}}{\text{Audio Noise}_{\frac{rms}{rms}}} = \frac{C}{N_{\frac{rms}{rms}}} + 22\ \text{db} = 48 + 22\text{db} = 70\ \text{db}$$

Minimum Acceptable $\frac{S}{N_{\frac{pp}{rms}}} = 49$ db Fade Margin$_{\frac{pp}{rms}}$ = 8.5 db

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Presentation by

Mr. Carl Menzer

Chairman, NAEB Engineering Committee
Director, Stations WSUI, KSUI
State University of Iowa

I think perhaps most of you are familiar with the NAEB tape network and probably many of its problems, among them being quality control. Representing the NAEB Engineering Committee, I would like to tell you briefly what we are trying to do to improve the quality of this NAEB tape network.

We feel there are roughly three parts to this tape network and its operation. The first probably is the making of the master tapes which are sent to headquarters for dubbing and then distribution to the various stations.

The chances are that there are almost as many recorders in use as there are manufacturers making them. That presents a problem which is quite obvious. So the Engineering Committee has set up a test, and if the various stations that submit tapes for dubbing will make this test tape, which is very detailed, and will send it to the test center, this tape will be analyzed and three reports made.

One report will be kept in the files. The second report will be sent to NAEB headquarters, and that can be used in adjusting the equalization of the dubbing machine. And the third report will be returned to the person who sends in the test tape.

Now, if that test tape meets specifications, the master tape can be made. If it does not meet specifications, then this report will tell the person or the engineer engaged in the work just exactly what's wrong so that he can correct his machine.

The second portion of the operation, of course, is headquarters dubbing, and I believe NAEB now has a full-time maintenance engineer with sufficient equipment to keep that equipment in proper operation so it presents very little of a problem.

The third portion of the operation is in play-back. NAEB can do, of course, very little so far as that is concerned—except that the service for the test tape is available for those people who use play-back equipment as well as for those who make master tapes.

I think it is quite obvious that NAEB cannot say, "Well, you are using Recorder X, and you should have used Recorder Z."

But, at any rate, this test tape will indicate, if anyone wishes to send one in, whether or not his play-back recorder is operating satisfactorily. If these stipulations are met, we feel that NAEB can provide a service which will be of the highest quality so far as the audio network is concerned.

Session III

ARE NETWORKS TECHNICALLY FEASIBLE?

Discussion Following Formal Presentations

DR. STEINER: I would be interested in the relative merits—and here I'm thinking of quality but especially economy—of the live network and videotape. It was stated by the engineers, or possibly someone else, that videotape was almost 100 per cent faithful in reproduction, and we get this from the commercial people, of course. And we have the figures on the cost of the other—that is, the live network. But we have to the advantage of videotape, flexibility which is probably uncontested and equivalent quality—and so I wonder what the jury for the live network would offer in comparison with videotape from an engineering standpoint.

MR. WEISE: I actually believe they complement each other. I believe a live network can be fed just as readily from videotape from an existing center point.

When I was speaking I pointed out the possibility of microwave networking through Ann Arbor. I could visualize very readily Ann Arbor serving as a network center just as New York or Hollywood serve as distribution points. I believe that they do complement each other.

I don't believe one would or should replace the other.

DR. STEINER: I don't quite understand that, probably because I'm not an engineer, but both have their costs. Is that not right?

MR. WEISE: Very definitely.

DR. STEINER: And we have to think in terms of economy. Now, is there anything that the live can do that the individual tape could not do?

MR. WEISE: Only the spontaneous presentation of an event that is taking place at a given instant, such as if you have a distinguished visitor in your studio and you want to feed this to the network. An example might be Mr. Khrushchev's visit. If he happened to be appearing in a Detroit system and in the studio, it would be very timely to be able to feed it to the network at that time.

Also it could be put on tape and played at some later date, such as happened with the CBS network, where it was played many times.

DR. STEINER: Now, just a last question. Khrushchev is only coming once, we'll assume, so this wouldn't happen very often. To prepare for this event, would this then justify, do you think, the installation of the live network?

MR. WEISE: Well, I just use this as one example. I'm sure there are many other timely instances.

MR. SCHENKKAN: I would like to comment on this as one who has had a little experience with both. We have a videotape recorder which, incidentally, as far as we are concerned, is as good as live. We can't tell the difference. When we've got it tuned up right, we're getting a live picture.

I think that this problem centers around costs. I think that's really the direction of your question.

DR. STEINER: That's right.

MR. SCHENKKAN: There's a session on Friday morning which deals specifically with costs. But I can give you very quickly here just two figures which might reveal some difference.

In our proposed twelve-college microwave network, if we were to service these institutions by means of videotape recorders, we would have more flexibility. The initial investment would be roughly double what we plan to put in, and the maintenance costs would be much higher. And this is no reflection on videotape, you understand, because I am a great fan. I think it's the greatest thing that has come along for educational television. But a very well-qualified engineer will have to stand beside each one of those machines any time it's on and part of the time when it's not. And this is not going to be true of microwave equipment.

But I think that is germane to your question.

I think Friday may be a time when this can be developed a little better.

MR. LOREN B. STONE: I have a couple of questions I'd like to ask Mr. Braum.

Is it not possible that you can pick up a station and feed it by microwave to a community antenna system? Can you feed a translator as compared with a cable system in a community from an existing signal?

MR. BRAUM: That is a very hot subject at the moment. Perhaps Mr. Krieger could give you a better answer than I could; Mr. Barr too.

About translators, the FCC rules do provide for translators and there are three or four now used by educational stations for extending the service of educational television.

MR. STONE: Can you put a microwave link, though, in between the original transmitter and the translator? We have a translator in our area in the State of Washington rebroadcasting us on a direct pickup.

MR. BRAUM: I believe not. I'm not sure but I believe not at this time. I know you can get other translators, however, and use them along the route as broadcast stations and as, incidentally, feed points for the further translators. Mr. Barr, do you want to comment on that?

MR. JAMES E. BARR: As a broadcast auxiliary service these microwave facilities are issued on two bases. One is a broadcast auxiliary service under the broadcast services, and the other is common-carrier services.

Now, a number of community antenna systems have gotten common-carrier permits for microwave facilities under the common-carrier concept and as common carriers—which they put themselves out to be to some limited extent—and have gotten licenses on that basis.

And that is where a lot of the controversy is coming from right now—whether they really are common carriers or not, whether the Commission should not consider the effect on broadcasting stations as a whole in issuing a microwave transmission facility for a common carrier or for—

MR. STONE: As far as licensing a broadcast station now, the microwave has to feed into a transmitter rather than away from a transmitter. This is essentially it? As far as licensing an existing broadcast station for a microwave link, forgetting the common-carrier part of it now, —

MR. BARR: A broadcast station licensee is eligible for microwave intercity relay systems, as we call them, on the basis of the off-the-air pickup.

MR. STONE: The end product of that has to go back into another transmitter?

MR. BARR: It has to be broadcast, yes.

MR. STONE: It can't then feed in the city over the horizon beyond the hill—it can't just feed a cable system in that town?

MR. BARR: Not the broadcasting city, no. These cable systems do have these microwave facilities.

MR. STONE: For their own pickup purposes?

MR. BARR: Yes.

MR. STONE: In other words, we as an educational station couldn't be licensed to put in a microwave link to carry our signal beyond present outer limits on into another community where it would then be put into a cable system?

MR. BARR: Yes. You wouldn't get that as a broadcast service. You'd get that in the common carrier. That again, as I said a while ago, is an area of a lot of controversy. The Commission has been turning the faucet off and on on those permits. They open them up for a while and then shut down and look at the problem. Right now it's open again.

The common-carrier type of license is being issued for microwave relay systems.

That has nothing to do with whether or not he is broadcasting or whether he does or does not put it on a broadcast station.

MR. RAYMOND D. HURLBERT: We have a community cable system in the northwest section of Alabama that wants to pick our signal up off the air. There would be no complication in that matter, would there?

MR. BRAUM: None, no.

MR. MARK JOHNSON (Welex Electronics Corporation, Washington, D.C.): In the matter of comparison of live broadcasting with tape, aside from cost, what for the educator is the critical factor in selecting live or tape?

MR. SCHENKKAN: I don't know whether that is an engineering panel question or not. Would anybody up here like to take a crack at that from the engineering point of view?

MR. TOWN: I don't know if I can answer that question in terms of other than engineering, but I might just go through and show some comparisons.

We start with film, whether it's kinescope recording or actual filming. We have complete flexibility as to the time the recording can be made and the ability to record at the convenience of talent, or whatever the situation may be.

One very important thing about film is guaranteed performance of perfection. We can stop and do it over again. We have the ability to record complete programs in one whole unit. We have the ability to assemble programs from component sequences and to integrate them from various sources.

Live or microwave, we can say that we have the immediacy or the "right now" appearance of the picture. It's happening at this moment. We have the ability to update material, bring it up to date on the air. And providing that the microwave link or the network facilities are reversible, each outlet is a potential program producer.

Now, we can add all of these factors, film and live, and add to that the reusability of stock. In other words, we can erase the tape and use it over again. This is an advantage over film. We have the ability, I believe, to record in unfavourable conditions.

For example, we might be able to do a remote broadcast using television equipment in the Grand Canyon. This also could be done with film, of course.

We have the economy of the production and the editing. We can stop the tape and go back and repair an error to the broadcast.

And that's just a general summary of the three put together—film, live, and tape.

MR. SCHENKKAN: Mr. Bouwsma, would you like to comment on that?

MR. FRANKLIN G. BOUWSMA: So far we have sort of made believe that kinescoping is all dead now. I do think that it should be brought out that many of the stations are discussing a greater use of kinescope in connection with the videotape machine because you can insure the processing coming out quite a bit better if you hold on to the videotape and wait for the print to come back from the laboratory, and if it didn't make it, you put it in again.

Secondly, with the use of the videotape recorder and the kinescope together, we will be able to make many, many more films for audio-visual use in the classrooms from the videotapes.

MR. JOHNSON: Yes, but we say we prepare the tape and the kine and we can retake them and we can make a very fine version. This goes back to our films that cost so much nowadays. We have done this today, and we take our film, we get a perfect version, and it costs to heaven.

Now, we will build up also a stock of tapes and a stock of kines, and the result is we will get a library of these, and that's fine. Then we will finally have a national library of these and we will have one central distribution point for the entire country. That's wonderful—and from here we get into George Orwell.

Now, it seems to me that we must consider what the critical factor is. Is there one? I'm not saying there is one, but I say: Is there something we must be careful of as far as the educator is concerned? That's what we must think of.

This is an engineering problem, and the engineer is subservient to the educator and must work for him. That's true. But we must think in terms of the problem of the the educator and what is going to be to his purpose and what will best satisfy his desires.

MR. SCHENKKAN: I think we are in the region of philosophy. I would like to make a comment on that in relation to our experience with teaching by television, using videotape. We have taught all our beginning chemistry, lectures and demonstrations. This is the only way they get it now.

The advantage of this over the kine method that we used—well, there's just no comparison. The advantage over live is that it makes it possible, because you cannot do this live. We have nine freshman chemistry laboratories. These are rooms which are full of freshman chemistry equipment. They can't be used for anything else because there isn't any room in them for anything else.

Even with nine such laboratories last semester we repeated the chemistry demonstrations eleven times. I think that's uneconomical myself because scheduling can be done tighter. It can be brought down to six.

Now, the main question which you raise is of the Orwellian aspect of this thing, and, of course, everybody worries about this, but one of the great advantages of tape over film in this respect is that once you have put it on film you have got so much invested in it if it's really good that you can't afford to do it over.

We have done those chemistry things over three times, and we're going to start again in the fall. I don't think we're going to have to do that with our German series because it's turned out in a way that seems to satisfy the instructors that this is about as good as it is ever going to be as long as they continue to use this particular system.

But when they decide they're going to get rid of this system and go to something else, we erase the tapes. We have thirty tapes that are ready to be used for something else.

MR. JACK McBRIDE: Will this question not be discussed at length—the effects on the educational community?

MR. SCHENKKAN: Yes, I think so. We're getting a little off this panel's subject.

MR. TERRY F. LUNSFORD: I have an engineering question. Does the Center have a figure on the minimum feasible lag from time of making a tape to getting distribution? In other words, the difference between spontaneity and the time you can use a tape if you want to?

MR. TOWN: Of course, that depends on where it will be broadcast and how many outlets it will be broadcast through.

Let's assume it was an emergency program of some sort. A tape feasibly could be air-expressed to the duplicating center and on a crash basis be mailed out, I would imagine, to forty-some-odd stations, within something like eight to sixteen hours air express.

MR. LUNSFORD: What about normal as opposed to crash?

MR. TOWN: We know now kinescope sometimes takes months before it's finally released to the affiliated stations. With videotape we should be able to do this in two weeks or a week, depending on the urgency of the program.

MR. LUNSFORD: Seeing Khrushchev now or seeing him in two weeks.

MR. TOWN: If it was something of that nature it possibly could be put out on a crash basis.

DR. ERICKSON: I may reveal my technical ignorance here, but I'd like to ask this question: What are the relative merits of repeater translator type networks as compared with the microwave networks that have been suggested today?

MR. BRAUM: A translator network would probably be somewhat cheaper and would be useful in providing service to the public along the route, and so I think that a series of such translators should be used in many places in place of microwave.

I might add this though: I think that some of these should be associated with regular stations that have much better coverage rather than a beam of coverage along the route, because I think some of the translators will give a rather limited service, and will be more like networking sources rather than regular broadcasting services.

As far as regular microwaves are concerned, of course, those won't serve the public either, and I think they might be perhaps a little more costly. Duane Weise made the remark a while ago that a microwave station would cost about $35,000 for a one-way circuit of about thirty miles. The translators are selling for about $3,000 each, and with the small building and antenna and so on, cost about $6,000 per unit.

Now, those will serve considerable distances, and the average distance reached by translators, those in operation in the country, is around twenty-two miles. So that translator networks could be installed more cheaply than microwave.

MR. STONE: What are the prospects for on-channel boosters in the foreseeable future, to get back down into the VHF band away from the translator frequencies?

MR. BRAUM: You're talking on-channel. The FCC has authorized a few experimental boosters. I'm thinking of those in New York State. And they're being tried out. I don't know what the future will be. I would guess that the Commission would be reluctant to authorize many boosters within close range of the principal station because of the interference.

If the terrain is such that the regular signal does not get in there at all, it might authorize the booster.

MR. BARR: I'm not sure I followed both questions too well. Mr. Stone was talking about the usage of the so-called translators for establishing a network—in other words, using them as for relaying programs from point to point. That is not the purpose of the translators in the first place. They are utilizing broadcast frequencies, frequencies intended for broadcast, and the perversion of that to a point-to-point service—which is what your microwave links are, simply a transmission system to get a program from one point to another—would be cause for concern.

We have said that there is no objection to repeated pickup and retransmission by the translator or satellite, (whatever we want to call them), but each one of the individual units in a chain of, say, three of them is supposed to be rendering a service around its location and not just simply be there to transmit the program from that point to the next one and the next one.

That's the difference.

MR. STONE: Two things at the same time. You might transmit a program from Seattle, Washington, to Portland, Oregon, and serve the intermediate area as you went along—instead of doing it by microwave and blanking out the whole intermediate area.

MR. BARR: I said that. But then the translator or the repeater type of station is serving as a series of distribution points.

MR. STONE: Then the extension of my question is whether or not it's ever going to be practical for us to do this on a non-channel booster and get away from this VHF translator. I mean a UHF translator in all-V area.

MR. BARR: I think they are going to make provisions for licensing all these hundreds of VHF repeater-type stations. When that is done it will be on much the same basis, I'm sure, as the translator, or not as a means for each one of them for a broadcast service and not as a means of getting a program from one point to another.

If there were any extensive perversion of the thing to that end, it would be cause for concern.

MR. BRAUM: I think the quality would go down pretty fast in a series of such stations.

MR. STONE: On the on-channel boosters?

MR. SCHENKKAN: What happens to picture quality on a series of translator stations?

MR. BRAUM: Picture quality holds up very well because the picture need not be demodulated, and so the quality can be very good over a large number of translations.

MR. BOUWSMA: What about the propagation of the translators up in the 70-80 megacycle bands?

MR. BRAUM: Propagation is pretty much a line-of-sight business like anything else in that part of the spectrum. But the survey made by the Television Allocation Study Organization (TASO) of most of the translators operating in this country showed that wherever there was line-of-sight propagation the service was good. In fact, in some cases service was provided beyond line of sight. That's rare and unusual and not to be expected.

But within fifteen, twenty, twenty-five miles—in one case much more than that—service has been found to be very good.

MR. SCHENKKAN: You raised a question there. You referred to the cost estimate that was given. This was $50,000 for a two-way system. However, it is possible, is it not, to make a system reversible without duplicating equipment? And isn't it possible to hold that $35,000-per-unit cost down well below that figure?

MR. BRAUM: Yes, it can be reversed by just switching transmitters and receivers at each point. It adds something to the cost, of course, but it would be much cheaper than the normal two-way system.

MR. SCHENKKAN: Another question which is directly related to that: If you have a single-channel microwave system serving a number of receiving points, you don't have to duplicate every piece of equipment, do you, in order to add another channel?

MR. BRAUM: No, you do not. You can multiplex equipment, the transmitters, into the same antenna dishes, for example, quite often. You can save some money. Of course, you can use the same towers, the same buildings, and so I believe Duane Weise's figures of $35,000 and $50,000 would apply in an instance like this too.

Does that sound reasonable?

MR. WEISE: Yes. The $15,000 difference really represents the additional technical equipment. The same towers, same passive reflectors, and the same buildings are employed.

DR. ERICKSON: You'd have two channels? Is that the idea?

MR. WEISE: Yes.

MR. BRAUM: Yes.

MR. SCHENKKAN: This is a partial answer to your question too, you see, as to duplicating facilities. I'm surprised that no one has asked a question concerning color and what it does to this whole problem. No one wants to raise that question I take it.

I'd like to say that I talked with someone who has just been to the American Medical Association meeting on television, the medical vice president of a university, and his report was that even the medical schools were backing away from color to a very considerable extent, that they were finding they could do it as well and a lot more easily in black and white. But it does, of course, complicate the technical problems enormously.

No one has asked any questions about Stratovision or scatter propagation, microwave, or any of these other wild projects. I guess there is no deep interest at this point in those.

MR. LUNSFORD: I would like to know just whether any one of these is so far along that it amounts to a new departure that's going to make a technological change pretty soon.

MR. BRAUM: Since Phil Coombs will be here on a later panel, I think that question perhaps ought to be directed to him.

MR. SCHENKKAN: Tomorrow afternoon we'll have an expert on Stratovision in the room, and I guess that question had better be directed to him.

MR. HULL: It just occurred to me in a proceeding of this kind where one of the end results is publication that we should identify color television, at least so it can be recognized as an issue, then treat it later in some manner.

We should make a distinction between some of the disenchantment that's being felt by medical and dental schools with respect to color television. At least I have understood that a lot of this comes from the use of vidicon systems in this case. And this is not necessarily true with an image orthicon system. And the implications are still such for medicine, for chemistry, for zoology that a low-cost system with good fidelity could be quite important in the future.

Many people ask vis-a-vis this new tape recorder the possibility of equipping it for color or converting it for color. This is a factor in long-term planning. And the same applies for Stratovision, scatter, and so on, just to identify them.

MR. SCHENKKAN: I think that's a good point—to add these as subjects which deserve some further consideration and thought.

Actually, of course, I don't know whether it is necessary for a technical person to speak on this point—of adding the color to the videotape recorders. Any one of us laymen can do that. The answer is like the question, "Are networks technically feasible?" And the answer is yes; you can do it if you get the money. And this is not so terribly expensive in the case of the videotape recorder.

Of course, it's the problem of the originating equipment that gets so expensive now in color, and, as Mr. Hull points out, the Land experiments may indicate that there is another way to do this altogether—that we have just been on the wrong foot for a hundred years on our color theory and that if we started over again right we might be able to do this very inexpensively.

I personally hope that this is so, because I don't want to get mixed up with those $66,000 image orthicon color cameras.

Session IV

LEGAL (AND LIABILITY) CONSIDERATIONS

Leonard Marks, Chairman

Session IV

LEGAL (AND LIABILITY) CONSIDERATIONS

Presentation by

Mr. Kenneth Yourd

Vice President
National Educational Television and Radio Center

We have been asked to discuss the feasibility of state and regional networks in educational broadcasting with particular reference to the legal aspects. If that is phrased as a question, the answer is obvious—and short. Of course, such a thing is feasible.

There are years of precedents. If money were unlimited and if the available spectrum were unlimited, there is no limit to what could be done and the manner in which it could be done. So what we really are concerned with is: What can be done within available resources? And in what manner can it best be done? And what are the limitations and pitfalls to be avoided?

I would like to see us first define a few of the words we are using. What do we mean by the word "network"? This word was originally used to indicate the interconnection of two or more broadcasting stations for the simultaneous transmission of a live performance to the public at large. It was applied to radio broadcasting in the early days before there were transcriptions and magnetic tapes.

In the days before World War II the result of the telephonic interconnection of broadcasting was the simultaneous transmission to a larger area than could be served by one broadcasting station of sounds which were being created at that instant. Since then—with the perfection of several methods of recording fairly permanently the actual performance, both audio and visual aspects—the conception of what is encompassed by the word "network" has broadened.

The result is that to many people the term "network" now means the dissemination of a performance in many geographical areas but not necessarily at the same time or not necessarily by interconnection through cables or relays. For example, there are in this country and throughout the world many commercial transcription and film "networks." The NAEB has for years operated a tape network for educational radio stations, as have several commercial companies for commercial stations. The National Educational Television and Radio Center has operated a film and kinescope network for educational television stations for five years, and now, with those same stations, is embarking on the establishment of the first operative videotape network in the world.

The commercial stations use land lines, coaxial cables, microwave relays for simultaneous interconnection, but they also use tapes, films, kinescopes and videotape in all manner of combinations for both simultaneous and delayed transmissions. There is also Stratovision—the idea of transmissions from an air-borne source to a large geographical area.

Methods of simultaneous transmission have limiting factors of two different general kinds. If land lines or cables are used, then one must recognize that the government has assigned this type of transmission to a public utility—the telephone companies—which assumes the duty of carrying the transmission in return for the payment of a fee which is in accordance with their published rates. These fees are pretty high for education's pocketbook. If we look to transmissions through the air, we find another kind of limiting factor. This is the scarcity of frequencies in the spectrum. For television particularly, there just are not enough of the frequencies we would all like to have—thus the arbitrary limitation on the number of television stations.

Since there has to be a policeman of the air waves, the job of allocation and licensing has been given by Congress to the FCC. Thus when we turn to microwave transmission from station to station or to the use of multiple open-circuit transmissions, we of necessity must operate within the rules and regulations of the FCC. Or, if the existing regulations don't permit that to be done which we feel should be done, we have the task of convincing the FCC that the regulations should be changed to permit it to be done—and they in turn have the task of weighing our request against all the requests of others (which may be conflicting) and of determining which course is in the public interest. This is easy to say and hard to do.

"Networking" without simultaneous transmission—if you will permit me to call it "networking"-has neither of these problems. If one can record good pictures and sound and duplicate many copies of the performance—and one now can with the development of videotape—then it is a simple matter to convey the same program anywhere in the country or the world, using established means of transportation. Here the item of time in duplicating and distributing is a factor, but that is not a legal problem. It has been my observation that "time" is a matter of concern where current events or other "timely" items are involved, but in the area of education this appears to me to be a relatively small proportion of the total output.

There are, of course, legal matters of which one must be aware regardless of the manner of distribution of the programs. I'll mention these later, but first I would like to raise a question as to the definition of one other term used in the title of this general session. It is the word "educational broadcasting." In the five and a half years I have been involved in "educational broadcasting," I've learned that the phrase means a different thing to almost every person who uses it. When the FCC first allocated channels for educational television broadcasting, the term was generally thought of as applying to television stations which broadcast open-circuit transmissions to the public. No one was quite certain what such stations would transmit, and thus a sort of negative definition arose—to the effect that such stations would not sell time nor broadcast paid or "sponsored" programs advertising any product or service.

In the beginning the educational television stations broadcast noncommercial programs directed to people in their homes, both children and adults, but this was largely what may be termed "liberal adult education." When the commercial broadcasters saw that "education" was acceptable television fare, they then began to designate many of their so-called public service programs as "educational television" programs.

Very soon after the educational television stations commenced broadcasting, many of them tried a few classroom instruction programs. Full or partial courses at all levels of instruction were televised, and this too was "educational television."

At about the same time the development of technical equipment permitted the establishment of closed-circuit installations in schools for full or supplementary course instruction, and this became known as "closed-circuit educational television."

Today those in commercial television speak of any systematic program of instruction (whether accredited or not) on a commercial station as "educational television." Those operating educational television stations speak of all transmission via open circuit over such stations as "educational television." Some persons dealing only with closed-circuit instruction speak of that as "educational television." Some few persons have lately been using the term "instructional television" to distinguish open-circuit or closed-circuit transmissions of systematic instruction from the more general types of "educational television" programs.

I mention this point because of the fact that the regional and national distribution of programs for systematic instruction in schools raises a problem at least quasi-legal which is not raised by the distribution of the more general type of program. This is the authority of each individual educational body to determine its own instructional pattern. I will not dwell on this point, as I'm certain it will be discussed in other sessions here.

Now to turn to other items of which one should be aware when the program to be disseminated goes beyond the one station or the one institution in which it originated. We are dealing in intangibles. We are dealing with services and creations of the mind rather than material, tangible products. In our society one lives by being paid in money for the product of his efforts. If one makes bricks and sells them, he nets some money on which to live. If one shovels dirt, he is paid in money for his physical labor. If one lives by creating beautiful music, he too must have some money. If one spends his life at an institution of learning teaching philosophy, he is paid for that effort a salary which is commensurate with the salaries paid to others engaged in comparable effort at that institution.

When television comes along, that individual is generally willing to permit his acumen to be demonstrated to a larger local audience. But when the program is to go to the whole region or nation, and the one performance is to be preserved and used many times, that individual then begins to wonder whether he may destroy his own future livelihood. Thus is raised the question of whether the individual has consented to the use of his service and product which the broadcaster has proposed to make. These questions can be settled in many ways (and it's not always with money).

But the important point is that in each instance the question must be settled before the performance and its distribution. The musicians' union has settled the question for musicians by establishing rates of pay for specific services, as have many other unions and guilds in the commercial entertainment field. It is to be noted that a rate of pay for a local service is not as much as the rate of pay for a performance to be distributed nationally. Some few of the union groups which have established rates for commercial broadcasting have recognized the difference in educational broadcasting, but not many. Educational broadcasting on a regional and national basis needs more understanding on the part of the unions and a recognition that rates of pay for services must be commensurate with the resources of educational broadcasters and the types of audiences reached.

Perhaps understanding will come as our educational networks develop, but at the moment there is great ignorance of our means and methods and objectives. One reason I earlier emphasized the matter of the definition of "educational broadcasting" is that this is not clear in the minds of those outside of the educational field. For example, to most people in New York City and elsewhere the whole of "educational broadcasting" is encompassed in "Sunrise Semester" and "Continental Classroom, 1958 Edition."

Another item is copyright. Too frequently educational broadcasters overlook the fact that there is a federal copyright act and that there are international copyright treaties, the purpose of which is to protect the rights of the creator of a work and enable him to seek compensation for its use if he so desires. Copyright is a complicated subject. The areas are not clearly defined when educational broadcasting is involved. I will not dwell on the subject. It is enough to point out that this area must not be ignored.

Session IV

LEGAL (AND LIABILITY) CONSIDERATIONS

Presentation by

Dr. Walter B. Emery

Professor of Communications Law
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There can be no doubt that there will be a further expansion of educational network facilities at the state and regional levels. There are bound to be some new and perplexing legal problems as this expansion goes on, but I am sure they will be met as intelligently and successfully as the problems of the past have been met.

The fact is, the history of educational broadcasting in this country is very much a history of overcoming legal obstacles. I recall back in 1934, when Congress was considering the passage of the Communications Act, there was a great deal of discussion by the Congressmen as to whether a provision should be put in the law requiring that 25 per cent of the broadcast facilities be allocated for educational and other types of nonprofit organizations. There were many who thought that the statute should specify this.

What Congress did was to enact Section 307 (c) of the Communications Act directing the Commission to make a study of the proposal and to submit a report with recommendations to Congress. Pursuant to this directive, the FCC conducted hearings on the matter. Educators testified, stressing the importance of providing adequate facilities for educational broadcasting. One professor who appeared in those hearings urged that some radio channels should be earmarked for exclusive educational use.

After evaluating the evidence in the hearings, the Commission decided against this proposal and reported to Congress in 1935 that it believed that additional legislation was not needed, that it appeared that commercial broadcasters would make sufficient time available to nonprofit groups. But the Commission implied that there was a legal obligation on the part of the broadcasters to do this and that, in exercising its regulatory powers, the Commission would see that this legal obligation was met.

As time passed, the importance of educational broadcasting was increasingly recognized and educators began to press their claims—not only for more time on commercial stations, but for the assignment of spectrum space for the exclusive use of educators. Therefore, when the Commission proposed to establish new rules authorizing the assignment of frequencies for FM broadcasting, organized education asked the FCC to set aside special frequencies for noncommercial educational use. There are persons in this room today who participated in those early hearings and who played a significant part in showing the Commission the need for this action.

As has generally been true, when education has presented facts demonstrating real need, the Commission responded admirably. In the late thirties, several FM channels were assigned for the exclusive use of educational institutions, and in the middle forties the Commission further increased the number to twenty channels and established special rules governing the service.

There was the problem of establishing rules which would make this service most effective. I was serving the Commission in a legal capacity at the time, and I recall we invited representatives of the NEA, the U.S. Office of Education, and other educational groups to come in and give us the benefit of their advice. We of course had the legal problem of providing rules that would comply with and implement all statutory provisions of the Communications Act. I remember the educators were then thinking in terms of developing state-wide networks, and they urged that the Commission establish rules authorizing them. As a result the Commission adopted a rule which said, in effect, that the Commission, in passing on applications for new educational FM stations, would take into account whether their proposed operations fitted into any state-wide plans for educational networks. Thus, the Commission gave its official blessing to state-wide plans and interconnections which would help achieve maximum utility from the special frequencies assigned to this new service.

Later, the Commission was asked to relax the requirements, to make possible the operation of educational FM stations with low power. Again the Commission responded generously and the request was granted.

Today there are more than 150 educational FM stations on the air, and the Wisconsin network has been in operation providing high-quality service to the people of that state for many years. There have been interconnections of educational FM stations in other states and many plans are under way to expand these operations into well-established state and regional services.

I need not repeat the history of educational television. You are all more or less familiar with it. Thanks to the interest and efforts of organized education and the skillful presentation of evidence by capable and dedicated attorneys, the Commission, responding in traditional fashion, reserved a large number of TV channels for education and established special rules governing the new service. Rules similar to those relating to educational FM were adopted and again the Commission provided for the establishment of educational TV networks.

Today we have forty-four educational TV stations on the air and several well-established TV educational networks are in operation and others are in the advanced-planning stage.

All these networks have had to overcome legal problems at the local and state levels. For example, I recall the early problems in the development of the Oklahoma Educational Television Authority, which now operates two interconnected stations in Oklahoma City and Tulsa, with microwave facilities to studios at the University of Oklahoma in Norman—and which has plans to extend its facilities to Oklahoma State University in Stillwater and to other parts of the state. While I was with the Joint Council on Educational Television, I spent considerable time in Oklahoma consulting with educators in the planning and development of that system.

The educational leadership of the state, together with local legal counsel, conceived the idea of setting up a state authority which would become the licensee of stations operating on reserved TV channels but which would have the advice of local educational institutions in the administration of network operations. Financing was to come from the sale of bonds to be paid off with revenue which accumulates in a special state fund derived from the sale of oil on state-owned lands.

In drafting the legislation there were two major legal concerns: (1) to see that the legislation did not violate any provisions of the Oklahoma constitution and (2) to see that it was in accordance with the Communications Act and the FCC regulations that implement that Act.

A number of attorneys were consulted in drafting the legislation. The state attorney general gave careful study to the legislation and made valuable suggestions.

A bill was finally drafted and introduced in the state legislature. It passed without too much difficulty and the Oklahoma Educational TV Authority was established. The Authority offered for sale more than a million dollars' worth of bonds. A purchaser offered to buy them but, as provided for in the law, he first filed an application with the state supreme court requesting an opinion as to their validity.

While there were no legal protests filed with the court, a question had been raised by some legislators and others as to whether the legislation violated a budget-balancing amendment to the Oklahoma constitution, which was passed in 1942, and which, in effect, placed limitations on the amount of debt which the state could incur. Therefore, the University of Oklahoma, Oklahoma State College, the Oklahoma Board of Regents for Higher Education, and other educational institutions—with the aid of their attorneys and the Joint Council on Educational Television—prepared a comprehensive *amicus curiae* brief dealing with the question and also supplying the court with a great deal of information regarding nationwide developments in educational TV and what this new medium could do for the general welfare of Oklahoma.

The court handed down its decision holding that future revenue coming into the special oil fund could not be pledged to pay off bonds but that any amount already accumulated, plus the additional amount to be received during the remainder of the biennium, could be pledged. This meant that the Authority had about $800,000 available. Bonds in this amount were sold and a station was established in Oklahoma City and a start made on the construction of one in Tulsa. Subsequently, with the help of private donors, a station was constructed in Tulsa and an educational TV network is now in operation in that state.

This is a short account of some of the legal problems which had to be met in developing a network in Oklahoma. Other states such as Alabama, North Carolina, and Florida have also encountered legal problems, though theirs have not all been the same as those in Oklahoma. In developing these existing networks and those which will come in the future, care has been, and must continue to be, exercised to see that any organizational setup for control, any methods of financing, the proposed use of public moneys, and plans for the distribution of programs, are in strict accordance with existing state constitutions and statutes. In the development of regional networks, these legal problems may be compounded and will require the most careful study to make sure that any compacts or other agreements among states providing for the sharing of expenses and programs and the establishment of interstate physical facilities will fully comply with state and local laws.

It almost goes without saying that the organizational structure and administrative machinery of these networks must be designed and must operate in accordance with the Communications Act and FCC regulations. Competent legal advice, therefore, should be sought in the early planning stages to make sure that no conflicts between federal and state statutes develop and that federal law is strictly observed.

In the few minutes remaining, I would like to suggest, or anticipate perhaps, some legal problems which will have to be faced as educational broadcasting networks expand in the future. One has to do with preserving licensee responsibility. Under the Communications Act, as you well know, each broadcast licensee has the legal obligation to determine its own program policies and service. This responsibility can not be abdicated. If educational TV networks assume large dimensions with programs originating at key centers, with agreements entered into covering a large number of stations in several states, it will be necessary to make sure that local licensees maintain the *primary* responsibility for selection of programs. And, as is true with existing commercial networks, affiliates must be left free to substitute programs of local importance for those of the networks.

Another problem, which is both engineering and legal, is the problem of securing adequate and appropriate frequencies for expanding networks. As was pointed out yesterday, the Commission recently made a decision which now makes it possible for educational broadcast stations to establish their own microwave facilities to establish intercity connections for network broadcasting without the necessity of depending on common-carrier facilities. Unfortunately, however, the frequencies assigned for educational use are in the higher bands and are not as desirable as lower frequencies would be. Educators with the help of their lawyers should redouble their efforts to secure these lower frequencies. The high priority of need should be impressed upon the FCC so that suitable interconnections of educational stations may be established at economical costs with high-quality reception.

The legal problems of copyright and program clearances will become more acute as networks develop. As you know, nonprofit educational stations at the present time are free to use a considerable amount of program material without getting clearances and without violating the copyright laws. The situation may take on a different aspect, however, as networks expand—especially if commercial stations become involved as affiliates in educational network organizations. The courts have held that an organization, even though nonprofit in character, may not use copyrighted music (even on sustaining programs) without permission, if the station carries any commercial programs at all. Well, in this context, what is a "commercial" program? Certainly any program of a station which derives any revenue from advertising would be. The question might be raised whether the use of copyrighted materials without clearance by a business concern doing an educational program on an educational station would be legal. The copyright holder might be more concerned and be disposed to protest if he knew that his music or his literary work was being widely disseminated over a network of stations and that the business concern doing the program would reap good-will benefits from such a widely received broadcast. What the courts might say in a case of this kind we do not know, but it behooves all those involved in educational TV to see that no programing is presented that has elements which might be interpreted as "commercial" in the sense that clearances for all copyrighted materials used on educational stations and their networks would be required.

Session IV

LEGAL (AND LIABILITY) CONSIDERATIONS

Discussion Following Formal Presentations

MR. MARKS: You now have a general background on the scope of the problems covered by what we regard as the title of this panel. I would like to intervene with a few specific questions and then you can think about questions that you might propose to members of the panel. We may not have the answers, but it would be interesting to consider these questions.

Mr. Yourd said, "What are networks? How are networks linked up? What is educational broadcasting?" Finally, "What are the rights of those who were responsible for the creation of educational broadcasting?" I would like to pursue his fourth topic in a little bit more detail. Specifically, when a program is created, there is the writer. There are the participants. In the educational field the writer may be a professor; the participants will be either a professor and students or a professor alone.

What are their rights? Do they have a right to be paid for the use of everything—film, kinescope, tape recording—that is produced in the classroom?

Remember that when a professor writes a book, he gets a royalty on each copy of the book that is sold. Does he have similar rights when he makes a film which may replace the textbook?

Secondly, what are the royalties due when music is used, and what must be paid to musical organizations such as ASCAP, BMI, and SESAC?

If performance is not for profit, as is customary in the educational field, are these music licensing organizations entitled to any compensation at all?

Third, is there an invasion of the right of privacy of a student when, without his specific consent or that of his parents, a television program is produced by using a television camera for the purpose of portraying him in a light that may be either favorable or unfavorable?

This is no longer a moot question, I might say, and I am familiar with one case where the parents of a student who was filmed in an educational program objected because in the process of dramatizing the incident the student was asked a question which he did not respond correctly to, and the parents felt that that held him up to ridicule.

Is there any legal right on the part of that student or his parents in a case of that type?

Now, in the distribution of films, because that is primarily where the problem arises, do you have any obligation as far as the creators of the program are concerned? In education, particularly, may you take a film that was produced by a professor and cut it in half, so that the intrinsic value may be diminished or altered or in some way slanted? In other words, must the content be editorially preserved in its entirety?

This is a question which I feel we will shortly face.

So much for the rights of performance as to the content and the production of films.

Mr. Yourd mentioned the fact that networks can be linked together either through the use of AT&T or through the use of radio frequencies assigned by the FCC. As we know, the AT&T rates are very substantial, frequently beyond the scope of those in the educational field. Last month the FCC released a report which I think will be a landmark as far as networks are concerned. In that report, dealing with frequencies over 890 megacycles, the Commission authorized the assignment of radio frequencies for linking networks together, even though none of the participants in the networks had a station broadcasting over the air to the public.

In other words, a private, interconnected network is now possible under the FCC rules. Regrettably, the rules themselves have not been released. Last night I asked some of the FCC commissioners, who were in attendance, when that might be done, and we were told that probably within the next three or four weeks the rules will be released, but the philosophy has now been recognized.

What are the obligations of those who plan networks in seeking those frequencies? How can they secure them? And what are the arrangements that will be made when the grant is made?

Now the panelists are available for questions.

MR. LOREN STONE: I would like the panel to go into the matter of rights.

MR. MARKS: Is there one you would like the panel to start on?

MR. STONE: In carrying programs beyond the originating station. That is a good one to start with.

MR. MARKS: Let me pose the question, then. What are the rights of a person who prepares a script or a person who produces a television film which is distributed beyond the originating point? Does that cover the question?

MR. STONE: Right.

MR. YOURD: Let's talk about scripts first, and let's say it is original material. The person who creates it, if it is his own creation, has all the rights in it. The question, then, is: What is your arrangement with the person who creates it? The man, if he wants to protect all of his rights for publication, can copyright it, get the protection of the copyright statutes, and then you deal with him on whatever arrangement you and he are willing to make.

Sometimes it is a payment of money. Sometimes it is other considerations.

I would like to vary that question a little, and mention music.

I think in the music field there is great confusion in most people's minds because the rights regarding music are, you might say, fragmented. When Leonard Marks raised the question of broadcasting of music and spoke of the performing rights and the performing rights societies, such as ASCAP, BMI, and so forth, he was talking about performance. And performance has come to mean the actual performance in public in the case of broadcasting over the air.

Now, that is when you have a single location, and I think it can be very readily asserted that in a noncommercial educational television station, there is not an obligation under the copyright statute to pay for performing rights in music. When noncommercial stations came along, it was the first time in history that there was ever actually a completely nonprofit situation. Isn't that true?

The point is that when you take this live performance and record it—whether it is film or kine or whatever—you get involved with another right asserted by the music publisher. That is called a recording right. The law isn't clear, but today they make it stick that you pay a special fee for the right to record the music. This is different from the actual live performance, and in this recording rate it makes no difference whether it is for profit or for nonprofit.

So that is where we get involved in music fees. The motion picture industry developed what is called the synchronization right, recording music in time relation to pictures, for which they pay high fees. There are many fragmentations even in music alone. It is not just a simple thing.

There was another part to that question.

MR. MARKS: The rights of the producer of the film.

MR. YOURD: That again is not an easy one. You don't say he has a right or hasn't a right, because there are all kinds of producers. There is a person with whom you contract to do your film job. You furnish him with the script and the actors. Generally, he has no rights at all. He is just a workman for you.

There is the other person who creates the whole project, the idea, the characters. If it is a drama, the characterizations, and so forth, are his. Then again you are in a situation where, provided he has properly protected himself, there is a question of working out an arrangement of saying who gets what and under what circumstances.

We have a small example of that in the grants which the NAEB and the NETRC have made jointly for radio programs. When we discussed the written grant, to define what people were going to do, we wrote into the grant that the producer would transfer to us, the distributing organization, the complete radio rights.

It has been interesting to me to observe that almost every single producer has assumed that he transferred to the Center everything. People write in and say: "Can we publish your script?"

They write to me and say, "Can we let these be published?"

I write back and say, "It is up to you. We didn't take a right from you to publish. You retained that right."

Or "Can we use it in the classroom, not broadcast?" I say, "It is up to you, because we didn't take that right either."

Too frequently people forget that there are lots of pieces to these rights, and that is why you set the arrangement down in writing, which defines just what it is you are talking about.

That is an obvious answer, but I hope it helps.

DR. CLIFFORD G. ERICKSON: The response to the question still does not hit the heart of our problem in Chicago.

Here we sit with 850 kinescopes, some of which might have distribution value. Our teachers have not written scripts, were not concerned about music. We are concerned about the teacher having created a teaching situation and that is now recorded on film and may be distributed.

Our teachers don't know what their rights are, what the situation happens to be. We are ignorant of this. Before we ever went on the air, we decided that maybe the Center would be interested in syndicating our films and so we presented to our teachers the standard Center release, which said that the teacher was signing his rights away in perpetuity, and the very first teacher to come on the air said, "I won't sign it."

MR. MARKS: You pose the problem I had in mind.

DR. ERICKSON: We have never had a teacher sign such a release, because we are in a complete dark void.

Is it not time for us to feel that we have an obligation to inform our teaching fellowship by some means as to the problem and to sit down, not with individuals who have created something, but with groups of people—groups representing school boards, college boards, the university professors, classroom teachers, and so on—and begin discussing this important question before we begin this far-flung network from Texas to Maryland? Because if we face these people with releases later, we may find these networks collapsing on our hands, because we don't have a very clear understanding, or we are not making clear to them that we realize that they have some property rights.

MR. MARKS: You have posed in very dramatic form a specific illustration of the problem that I have had in mind in presenting the question earlier in the panel. For several years now, the NAEB has recognized this problem, and I as counsel have tried to assist in arriving at some solution. It is not an easy problem, but saying it is not easy doesn't solve it. I think your suggestion is wise. If you are going to have networks, the problem must be faced and must be solved. You probably hired those teachers who prepared those 850 scripts to teach and not to make film. Is that right?

DR. ERICKSON: We had an understanding that we were going to in fact kinescope many of our programs. We have an understanding with them that we will record and we will re-use these recordings in our own situation, but we have another understanding with them that, should we ever choose to use them outside our system, then we must talk the whole question over again.

MR. MARKS: Let me say to you that the problem cannot be solved by a general statement. Each individual may have a different arrangement. Each school may have a different arrangement. So it depends upon the contractual arrangement that was made at the time of employment of the teacher. But there are certain similarities; there are certain common problems that can be faced by a conference of representatives of teachers and universities and producers and talents and what-have-you.

I have just returned from a trip to Geneva, where I met with representatives of the European Broadcasting Union, whose members have similar problems, not as much in the educational field, but in the noncommercial television field.

And they are greatly concerned about a treaty that is now being not negotiated, but prepared by UNESCO on this very subject. I had known only generally about it, but while in Geneva I made a very careful study of the preliminary negotiations and find there is no exclusion for noncommercial educational programs in the United States.

And the present proposal for the treaty would allow all performers, creators, producers, and what-have-you, individual rights in the program if the program which they produce is subsequently distributed either through film or videotape.

I think this represents one of the most serious problems to the feasibility of networks that we are talking about. I would like to leave this meeting with the suggestion that, as a result of this panel discussion, representatives of the organizations interested in the problem should at an early date attempt to arrange a conference of interested constituent organizations for the purpose of arriving at a solution rather than just trying to say the problem might disappear. It won't. It is going to be with us for a long time.

DR. R. R. LOWDERMILK: I wonder if we ought not to carry that a step further.

We risk the danger of looking for solutions to cover educational television as a whole when actually, I believe, we need to differentiate three different types of educational television.

First, educational television broadcasting. I can see where all the copyrights, all the proprietary rights, performing rights, and so forth, apply there. As opposed to that, we have a different type of educational television that may involve a second use, which is the distribution of more or less conventional teaching. It may take the form that it does up at Penn State, where Dr. Carpenter, Dr. Greenhill, and their staffs are using closed circuit to distribute, more or less, conventional teaching.

In the case of land-grant colleges and extension departments, they are distributing courses. In that case, television is simply the vehicle for distributing teaching.

The third use is quite a different kind of animal. It is the thing that is probably most dramatically represented by the Hagerstown project, where we don't care about the distribution as such. We are certainly not producing educational shows, but television as a means of implementing teaching, just as you would use an overhead projector to implement teaching.

I doubt that you can figure out any single solution to cover all three of these. So I would urge that we take a look at three different uses.

MR. MARKS: There may be others.

As I said, there is no one common denominator, but there are similarities to all of these problems, and that is why a very detailed study should be made and it will take some time, and some very constructive thinking.

DR. JOHN SCHWARZWALDER: I wonder if we can get some of the distinguished panelists to suggest a procedure in so far as the commissions of the various states are concerned, whereby the common-carrier facilities (that aspect of a regional network) can be attacked. There are different laws, I am fully aware of that, in most states. What is the best way of doing this? Just start in state by state and get a good lawyer in each state, or is there some simpler way of doing that?

MR. MARKS: I will turn that question over to Walter Emery. Before he gives you his answer I would like to suggest that the problem be presented to the conference of governors. There is also a national organization of public utility commissions; that would be an organization which could attempt, through uniform legislation, to meet the issue if there are problems that are similar in the various states.

DR. EMERY: I think you have answered the question pretty well. I will say this: At the present time, you know the FCC has made it possible to establish these microwave networks without using common-carrier facilities. However, as was suggested yesterday, the frequencies which have been made available are not the most desirable.

As Seymour Krieger suggested, a petition has been filed for reconsideration. If the Commission turns that down, there will probably be other petitions filed. And until we do secure the desirable frequencies which make it possible to establish effective microwave networks, we operate under a handicap.

When I say that you can establish microwave networks without the use of common-carrier facilities, it is pretty easy to say. You get into some areas of the country where it will be difficult to secure common-carrier facilities and then you have the problem of establishing microwave facilities, and so on.

I would like to say, "Amen," to what Mr. Marks has said. I think that this requires the cooperative and co-ordinated effort of public utility commissions and regional groups like the Southern Regional Education Board, and it is a matter that ought to be fully discussed, and certainly the National Association of Educational Broadcasters should carry it on.

Aside from this, I think that as these networks develop, there is going to be an increasing concern on the part of professors about the use of their ideas. Being a professor myself and very much interested in having these professors paid for their services, I think the increasing result will be that it will become more of a problem. I think that, when a professor spends a great deal of time preparing lectures, knowing that these lectures are to be received by stations all over the country and heard by millions of people—when they are to be recorded or put on kinescopes—he is entitled to have his property rights protected. And I suspect that such organizations as the American Association of University Professors and others will be very much interested. So I am glad to get the suggestion, Mr. Marks, that you are going to consider the problem before the networks develop.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

John F. White, Chairman

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. Edgar Fuller

Executive Secretary
Council of Chief State School Officers

It is my function to deal with some possible effects of state and regional ETV networks on the educational community. The Council of Chief State School Officers has policies favoring the development of educational television. In more than one-half the states there is legislation concerning ETV, and many chief state school officers are active in this field. The opinions expressed here, however, go beyond the general policies adopted by the Council, so they must be regarded as personal.

All of us in education are committed to improve it in every possible area: the curriculum, the content of courses of study within the curriculum, the quality of the teachers, the physical facilities, and especially the subtleties of the teaching-learning process that cannot be tested by measures of how many facts have been learned and retained. To the extent that ETV helps improve total learning in the truest sense of learning, it is justified; to the extent it does not do this, it is not justified.

Educators will eventually insist upon objectivity in rating ETV in terms of improvement of learning. Will a film do the job better? If so, we should use the film. Is radio, that half-forgotten medium that is here along with and in spite of television, being used as it should be used in the schools? If not, why not? Is it possible that some things we may try to do through television can be done better through books or slides? Or through other means? No vested interest in using television should obscure an objective approach to the best teaching aids, whatever they may be.

Let me illustrate specifically what I mean in implying that educational progress may not always be forwarded by ETV. Recently, the Council of Chief State School Officers prepared a Purchase Guide for state and local school systems throughout the country. This Guide describes equipment and materials recommended for use to improve instruction in the sciences, mathematics, and modern foreign languages. Staff and advisory experts representative of the Modern Language Association recommended use of electronic installations of various complexity for teaching modern foreign languages, with the most complex ones designated as language laboratories. They did not recommend television for this purpose, since (they felt) audio is better when used alone in beginning the learning of a new language.

The movement toward use of electronic classrooms and laboratories reverses almost completely the traditional methodology for foreign language teaching. It is by all odds the major "growing edge" in American educational methods. Is ETV going to assist, or possibly interfere? ETV can find a special place where it can supplement the language laboratory when the visual is needed along with the audio. This sort of evaluation of the use of ETV should take place in every field, under the single major criterion of improving learning. ETV can improve the quality of teaching in many fields by bringing to teachers the best methods in those fields, even when the methods shown involve teaching aids other than television. ETV should not dash in to do everything itself—only the things it does best.

ETV, then, should be supported in so far as it improves learning. It is necessary to reject uncritical promotion and to exercise objective judgments on the basis of the evidence. It seems to me that such judgments can be based on rather clear principles.

OPTIONAL VIEWING

For instance, where viewing is optional, there seems little reason to suppose that educators should refrain from supporting maximum development of nationwide ETV service on open channels, both educational and commercial. It is surely in the public interest that the types of adult education programs illustrated by Edward R. Murrow's documentaries and the "Omnibus" series should be made more widely available. Special features for special audiences are limited only by lack of imagination or lack of resources. Such features can include discussions of important local, state, national, and international issues, programs for children of all ages during hours when they are at home, the fine arts, and systematic courses for persons of any age who may elect them with or without academic credits.

The personal option on how much to use television in learning is also a common privilege of the more mature students in colleges and universities. They often have alternative courses, or they can go to other colleges where television is not so much emphasized.

CAPTIVE AUDIENCES

Educators will be more sensitive, however, about what ETV offers to captive audiences in elementary and secondary schools. These children and youths are held in groups for 180 or 190 days a year through the force of the compulsory attendance laws. It is inconceivable that any considerable number of these young people will be forced into ETV study over any considerable period of time, unless it is really beneficial to them. ETV can impose on pupils just as a very poor teacher does. Perhaps it may impose even more inescapably, since a poor teacher can be removed more easily than an operating network.

This means that the percentage of students who do well with television instruction must be balanced against its effects on other students who do better under instruction throughout the day by teachers and teaching aids providing for two-way discussion. I submit that we do not yet know enough about the total effect on these captive audiences to justify dogmatic promotion of mass ETV in the schools.

EDUCATIONAL COMMON DENOMINATOR

This leads me to another point in connection with state, regional, and national ETV networks. Television can teach facts; it is better than no teacher or an incompetent teacher; it can supplement the work of any teacher; and it can greatly expand the range of a superior teacher in so far as TV can carry that teacher's contributions to the pupils. Nevertheless, the larger the network and the greater the audience, the less flexibility there is in the classroom.

Mass audiences have brought us low mass standards in commercial television, because the cultural common denominator for advertising is low. For different reasons, network ETV has a similar problem. Mass ETV audiences must receive broadcasts based upon an educational common denominator, and the larger the audience the larger the number of pupils whose needs do not fall within that common denominator. The wider the range of the so-called master teacher, the more pupils he can serve effectively—and the more pupils he cannot serve effectively. Is it possible that the proportion of pupils not served well increases as the scope of the network increases? May it not be likely that 50 teachers for a subject presented on 50 state networks will perform more hopefully for the future of ETV than a single teacher on a national network or a few teachers on a few regional networks? At the same time, a live national network for optional listening may well be sought.

TEACHING PROBLEMS

To make the pre-broadcast preparation and the post-broadcast discussion most effective in the classroom, television lessons should be available to each class for more than a single showing. Perhaps the most basic difficulty in television instruction comes from the inability of the students to ask questions and to present their views for immediate discussion and evaluation. It appears that the Stratovision project now contemplated, the videotape project, and state, regional, or national live ETV networks can provide for this service, as a practical matter, only through kinescopes or other reproductions for re-use in classrooms.

There may eventually be danger of over-emphasis on television in preparing students for lifelong learning. Possibilities for television learning will be with them throughout their lives, and they should know how to take advantage of them. At the same time, they cannot afford to neglect reading. The use of printed references is indispensable, because it is in this area that a person can exercise the option of studying any of the millions of books and periodicals available. Television is less flexible. A viewer must take the subject that happens to be broadcast. Purposeful learning in the fields of his greatest motivation may be lost if he looks too much and reads too little.

FINANCE

The question of how to finance ETV stations or networks is important. ETV as a supplementary teaching aid necessarily costs more than traditional teaching alone. Television saves money, if at all, when class size is greatly expanded or when pupils are denied a competent teacher with each class of reasonable size to prepare for the broadcasts and to discuss them afterward. One may doubt that any real improvement of instruction through television will cost less than good traditional teaching.

It was discovered several years ago that school budgets provide a sound financial basis on which to operate ETV stations for general community benefit. If ETV increases the costs of schools without supplying in-school ETV that clearly improves instruction, the net result for the schools will be negative. Promotion of ETV in the schools to justify a regular source of income, in so far as it exists apart from the function of improving instruction, may not long survive in the face of competition for funds that will be certain to improve instruction.

Until we know more about the educational effects of TV, there is inherent danger in large-scale network programing for school use if the purpose is to reduce broadcasting costs per pupil. The financial compulsions of networks lead toward total or direct teaching by television, which may easily become an educational catastrophe in the elementary and secondary schools.

Educators were quick to recognize ETV as a potentially great supplementary tool for the teacher to improve instruction, but this idea has undergone a radical change. Due to over-zealous promotional activities, the average businessman, school board member, teacher, or parent is now likely to associate ETV with saving money. The public image of ETV as a financial panacea has served the purposes of those who oppose even reasonable educational budgets. Some are willing to seize upon almost anything, with or without proof, to save money or teachers or buildings. I submit that in its present state of development, this is a dangerous public image of ETV, if the improvement of instruction is its major goal.

TIMING AND MONEY

Educationally useful ETV can probably be financed without difficulty, once it has fully established its place in the educational program. Meanwhile, there will continue to be some fiscal troubles, but there is probably enough money at present to establish within a reasonable time the legitimate claims of ETV for funds. It may seem to be heresy to some, but to me it appears that the development of educational television is taking place at a pace rapid enough to serve the best interests of education. A sound development, without over-commitments of funds, is needed. Plunging into network operations on a wider scale may in the long run bring negative public reactions that will set back the cause of ETV.

ADMINISTRATION

By its very nature, television must be regulated by the federal government. The Federal Communications Commission makes rules and regulations for the control of television broadcasting of all kinds, including educational broadcasting. For the most part the FCC has been reluctant to influence programing. Under this policy, commercial television reflects a struggle between freedom of broadcasting on the one hand and regulation in the public interest on the other. Many Americans believe that this freedom in using a public resource has emphasized advertising and other commercial interests at the expense of quality programing.

The considerations in ETV networks are quite different. Commercial networks operate on the basis of the freedoms of our economic system. On the other hand, freedom from federal programing regulation in ETV rests almost entirely upon the ability of the state and local governments to prevent federal controls over education. Commercial networks are supported specifically by a powerful complex of business allies. These forces are in a strong position to defend their economic interests against federal interference. It is a disquieting thought that education may have far less strength to resist federal controls over ETV, since its case must be based more upon ideals than upon economics.

The promotion of a national live ETV network by 1968, launched last year by the managers of the ETV stations affiliated with the National Educational Television and Radio Center, may or may not be in the best interests of education. On the programing side, research and experience will in time provide an answer. On the administrative side, however, education could easily be led into a long-term fiscal trap from which it would have the utmost difficulty in escaping, whether or not the educational results are really good.

The reason is that the cost of a national live ETV network would be very large, and that most of its backers want federal funds to build it and perhaps to operate it. Control by the FCC of the physical arrangements for television is one thing, but federal control of funds which make it possible to teach the same televised lesson in classrooms from coast to coast is quite another. Public policy in education would be involved, and the decisions might easily be made for reasons other than the improvement of education.

Such legislation as the Magnuson bill passed by the Senate last April, considered as a "one-shot" aid to get physical facilities in each of the states for state use, would be comparatively harmless so far as subsequent federal controls are concerned. Even in this instance most chief state school officers, who have had extensive dealings with a number of federal agencies, would undoubtedly recommend that state and local autonomy be carefully protected during the planning and construction period.

State-supported ETV networks, even with some federal assistance, would be less likely to suffer from federal controls than a national network. Organization for ETV, as Dr. John E. Ivey, Jr., has recently said " ... should be within the boundaries of traditional state and federal relationships. These boundaries hold that the states and localities shall have the primary responsibility for providing a system of public education." The states and communities will almost certainly have difficulty protecting education against tendencies the federal government would have to influence the educational use of a national network. Allocations of federal funds for maintenance and operation of such a network year after year would surely carry with them more danger of federal control of education than any general proposal for educational support now before Congress.

So let us begin at the local and state levels when captive audiences of school children are involved. Let each state, as Justice Holmes long ago suggested, become a laboratory for experimentation and progress. Let them learn from each other during a period of years to establish the educational place of television in classrooms. Concurrently, we can learn a great deal by moving ahead rapidly on open-circuit ETV broadcasting to all age groups on an optional basis.

We should press forward with research and experimentation in every direction to harness the wonderful potentialities of television for education. The Stratovision experiment, the videotape network, the controlled experiments in school systems and colleges and universities, and other research should be liberally supported. Here is an area in which fear of federal control of education need not restrict the federal government from full partnership, as it is in full partnership for this conference.

It has been a privilege to work closely with many of you during the past decade. You and your colleagues have contributed greatly to education, but your greatest contributions lie ahead. We must work together vigorously, but patiently, to improve all phases of American education and culture through use of the powerful teaching tools now available.

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Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. Edwin P. Adkins

National Coordinator
Continental Classroom Project
American Association of Colleges for Teacher Education

I will attempt to enumerate a few of the things which we think we have illustrated in the "Continental Classroom" program, and then end with what I think might be considered two personal pleas, but pleas based on experience with television over the last several years, both closed and open circuit.

When we launched the "Continental Classroom" program last year we began with two basic assumptions to which we adhered rigidly throughout the program and to which we are still adhering:

(1) Any kind of education on the national level (for that matter, on any other level, but we were thinking in terms of the national level) should be controlled specifically and in detail by a responsible educational organization. Therefore the American Association of Colleges for Teacher Education undertook the job as the academic sponsor.

(2) Each participating college which dealt with this program in any manner should exercise its own controls, in its own individual way, over the materials presented.

Actually the national office represents the American Association of Colleges for Teacher Education as a recommending group, and that is all. We recommend standards to the colleges. We recommend various other things to the colleges, but it is up to each individual college to adopt its own rules, regulations, standards, procedures, when it uses the course presented on "Continental Classroom."

We also had another principle which we attempted to adhere to and I think we did. That is: Television on a national scale should not attempt to do what the colleges and schools do, or are able to do themselves as well or better, at least in a limited period of time. If national television tried to be all things to all people, then it would not be the kind of education we want in this country.

There was no attempt here and no thinking on the part of anybody involved that this national television program would replace anything the schools were already doing. This was a supplementary role which was adopted. There was a need on the part of a special group in the country, a special need for a special group, and it was our purpose to fulfill that need.

Of course, that need was on the part of the science teacher in a field where developments had been very, very rapid in recent years. A teacher had had very little opportunity even when he was well qualified, and we all know that all teachers in all fields are not necessarily well qualified these days. Nevertheless, assuming that they are in a field which has moved as rapidly as atomic age physics, they have had little opportunity to keep up. And here was an attempt to do two things, then, for this group of teachers.

(1) To update them in the material in that field—the subject matter material—which had been developed in the last few years since those people had left school. In many cases, of course, they had not had a chance to have a course in this particular field.

(2) To demonstrate, through the teacher employed, at least some good ways for presenting that material—not a methods course in the traditional sense or in the education sense, but a methods course by inference, I suppose we can say; not saying that this is the only way it can be done; just saying this is one good way. And these are some good materials which can be used in presenting this subject matter to high school students.

We learned certain things, I think, during the year. We think we have illustrated at least that we are safe when we are controlled in our national efforts by responsible educators. We are not quite as certain we would be as safe if the educators lost control of this medium. In fact, we are certain we would not be. We have illustrated that the student on all levels does best when there is local control, when there is local discipline, when he does have local leadership, national though the program may be.

Therefore it becomes a rather individualized thing in each college, you see, where there is a teacher there. This is not replacing teachers. This is supplementing the effort of a local teacher on each campus. While this is the broadest program of an educational nature, I suppose, which has ever been presented, we nevertheless tied it very closely with each institution, and with a teacher, whom we called the coordinator in each institution. We think we have illustrated that a superior class can be produced and can be presented and can be individualized, at the same time. We think we have illustrated that, when enough money is available, we can do a superior job in educational television.

We need two things to do that, though. The first I have already mentioned. We need money and lots of it. And we need superior talent. We don't need an actor, we need a superior teacher. There is a great deal of difference, and somebody intimated yesterday we have long since passed the place in educational television where we think a teacher to be superior on television must be half ham. That is gone. Harvey White indicated it over and over in his 180 lessons this last year. A good solid teacher presenting good solid material, using good teaching methods, is what we want—not an actor hamming it up.

This "Continental Classroom" plan, then, was fairly successful. Remember we devised this from thin air, more or less. There were no precedents to go on. Actually, except for a few local experiments that we had around the country, there were none. But the local business of tying a national program very closely to 265 college campuses, and in addition to those 265 campuses, hundreds of other groups in industry and so on, in the communities around the country, became a very large task, to say the least.

We found out, for example, that we needed special materials. We knew this. We thought before we even started, that if we were going to devise special courses for special groups, we must also devise special textbooks and other aids of that sort, and we must enlist the aid of publishers, and work very closely with them. In the second year of "Continental Classroom," we are experimenting in this area. One of the leading publishers of the country is putting out a textbook and a guide written by the national teacher of the new chemistry course. We will see how it works at a very low cost. This we are also interested in. If we can fairly well assure a publisher of a market, he will come in; he will work with us; and he will be willing to commit money, a great deal of money, and then he will be willing to sell those books at a much lower cost to the student than the traditional chemistry textbook has been selling in recent years. Instead of seven, eight, nine, or ten dollars for a textbook, the student here is going to be paying two and a half dollars for a paper-covered book.

That might also be of interest to education, and it might become one of the most significant things we have done in the development of this broad kind of course; nevertheless, we know now we must have something to put into the hands of students, for several reasons: The student is used to having something there. And we have students who have been students for a great many years in one capacity or another. They are used to it. This is the system. They want it. It provides a guide that can be followed all the way through.

I could go on if time permitted and develop many other points relative to the "Continental Classroom" program; in the interest of time I want to go on to two other points, after which I will close.

Where should the money come from in support of our networks which we are talking so glibly about? I am convinced the money for facilities will come much more easily than the money for production. Production money—Where should the money come from? And who should control?

I am a great worrier, I suppose, in the field of education. I am afraid we have a new medium here, which is so spectacular, so interesting, and so limitless in its possibilities, that the control may fall into the wrong hands. This is possible. I do not want to see educational television developed as something apart from our public education system in this country; I don't want to see educational television become an instrument of industry or the foundations or any other group other than the people themselves.

Traditionally, education has been in the hands of the people of this country. I think it should remain there. I think we may lay our own trap here for ourselves if we are not very careful. We are so anxious to get this thing under way, we are so anxious to see our dreams fulfilled, that we will take money from almost anybody who will give, on the assumption that we can clean up tainted money once we have it.

When we have our annual church drive at home, we are always concerned: Should we go to the bars? That is a good source for money, you know. They are always glad to make a good contribution to a church representative.

Our minister debates this back and forth. He says, "If you do take it, I'll have my back turned."

I think he has taken the right stand. Yet I think it is a little hard to clean up tainted money, because control comes from where the money comes from. And don't let anybody kid you.

I have been very close in the last year to a great many well-intentioned people in industry and the foundations and other areas, and there is an interplay of forces here which are not necessarily of an educational nature, and there is an interplay of motives, not necessarily of an educational nature in the traditional sense.

Let us be careful, then, of the kind of money we take and how we use it, and the strings which are attached, either visibly or as a part of the hidden agenda. It is very difficult to do a program without money. In fact, it is impossible. It is impossible to build our networks without money, but let us launch a drive in this country, a sensible approach to the people. Let us make this a part of our public education system, our traditional system of education. Let's not have it something apart. Let's not have it even controlled by educators apart from the profession, well-intentioned though they may well be at the present time. What happens ten or twenty years from now? Let's get it started right.

The money for the facilities will come. We can build our educational stations, closed circuit and open circuit. This is going to come, and it is going to come fairly rapidly. We are not going to get the money for production as easily.

Perry Como signed a contract in the recent past for the next two seasons for 25 million dollars for 66 shows. Well now, Perry is worth that, I am certain of that. I am not quarreling with what he gets. I am all for it. That is great. But I also know one two-studio system in a college (two well-equipped studios ... with about 15 classrooms tied in, handling maybe a thousand students . . . operating at the same time three classes on open circuit) with a total budget of $25,000 for about 35 hours of broadcasting a week. That is on both open circuit and closed circuit.

How do we get that way? We had better not do it at all than to put out shoddy educational television programs. We are going to lose more. Let's hold out for production money. It is going to cost money. It is going to cost lots of money. Someplace along the line we have created the impression, as Ed Fuller intimated a moment ago, that educational television is going to save a lot of money for the taxpayer, the poor, overburdened taxpayer. I am sorry for him, too. ETV may save money in some places, but it is going to cost in others. And the last time I looked, the taxpayer still had only two pockets, and we might as well face up to this frankly and honestly.

Television is not an inexpensive medium. Television will not solve the teacher problem or the college dormitory problem or all the other myriad problems that now face education. Television can be the greatest supplement we have ever had to education. Television can play the most important role of anything new that has been added in scores of years. But educational television is not going to solve all the problems, and particularly not the financial one.

Educational television, if it is done properly, (and I submit to you there is only one way to do it, and that is properly), is going to cost a lot of money, and it is going to cost a lot of production money. We can't have a teacher go on the air and give him fifteen minutes for preparation out of his daily schedule, as one teacher was doing whom I met this year. This is literally true. He had been given a great concession. He had fifteen minutes taken out of his schedule.

I am impatient with what has been going on in the production world of educational television. Let's keep these two points in mind. Let's be careful on the one hand where the money comes from, but let's be careful, on the other hand, that we get it, and that we plow it into production as well as facilities. Otherwise, we will lose the war, although we may win the battle.

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Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. Sam H. Moorer
Representing
The Association for Supervision and Curriculum Development
Director
Division of Instructional Services
Florida State Department of Education

My assignment, as a representative of The Association for Supervision and Curriculum Development, is to comment briefly on the possible effects of state and regional networks on curriculum development.

For the benefit of those who may not already be familiar with ASCD, I would like to point out that it is an association of NEA with approximately 6,500 members representing a cross section of educational personnel and some lay groups. Membership in ASCD consists of curriculum workers bearing various titles such as instructional supervisors, curriculum coordinators, directors of instruction, and the like. Many classroom teachers, school superintendents, professors of education, school board members, and PTA representatives are members. In addition, there are student members among those who are in training to become teachers.

Since leadership in ASCD has never subscribed to a "cult of orthodoxy," I would not be so presumptuous as to say that my remarks could be considered as representing the entire membership of the Association. ASCD encourages differences of opinion with full and free discussion of crucial issues facing education in our times. In looking through the many publications of ASCD and in examining statements of beliefs subscribed to by the membership in general, I found no specific statements purporting to present an official viewpoint of ASCD on the topic at hand. Any statements which I might make, therefore, should be considered as my own interpretations.

First of all, I would like to enumerate briefly certain principles upon which curriculum development in this country has been based in the past. I believe that the way in which I have worded these principles will be fairly consistent with the point of view held by most curriculum workers today. These principles are as follows:

1. The ideal unit for curriculum development in its specific and detailed aspects is the individual school faculty operating under the leadership of the school principal. This is based upon recognition of the fact that no two schools are exactly alike. To

the extent that individual schools differ, curriculum adaptations must be made in a particular school and in each classroom within the school.

2. Since it is true that there are many common problems, conditions, and needs running through a local school system, there are many aspects of curriculum development which can be worked out most satisfactorily for the local school system as a whole.

3. By taking this one step further, we bring the state into the picture as we recognize that some of these problems, conditions, and needs are common to the entire state and can, therefore, be worked on state-wide. It is, therefore, desirable to have a broad general curriculum framework developed at the state level within which local school systems and individual schools are encouraged and assisted to develop specific programs most appropriate to their situations. I am sure that this could be taken still another step and applied to a region of the country to the extent that problems, conditions, and needs are determined to be common throughout the region.

4. Changing the curriculum means changing people. Processes used in the development of curriculum materials and content should not only provide useful materials but should also provide for professional growth of those engaged in the process. Then, too, people understand better and tend to support those things they have helped to create.

5. Since the direct administration and supervision of individual schools throughout our nation is delegated by state laws to local school districts, state-wide and regional educational groups should always work with and through local leadership and should be active in the discovery and development of educational leadership at all levels.

If we believe these principles to be sound, then there need be no controversy over whether the curriculum should be built at the state level or at the local level. It is not an "either/or" proposition. It becomes readily apparent that some aspects of curriculum development are most appropriately worked on entirely at the individual school level. Others are more appropriately handled at the system-wide level and at the state level. I am sure that some would profit from regional as well as nationwide consideration.

It would seem to me, then, that the effects of educational broadcasting networks would be beneficial to local school communities to the extent that these principles were carefully observed. This would mean that aspects of curriculum development undertaken for network use at either state or regional levels would be those which met needs considered to be most common and most widespread throughout the state and the region.

In other words, those responsible for developing programs of network educational broadcasting should carefully study and select those aspects of the curriculum which can most appropriately be developed and presented via the educational broadcasting network. Just as a vast amount of experimentation and research is now going on in order to determine what subjects and what goals of education can be best enhanced through television, we need to determine how widely it is appropriate to standardize curricular offerings through network presentations.

It is a well-known fact that effective teaching is largely dependent on a knowledge of the learner's personal characteristics, including his capacities, interests, and aspirations. The problems of providing for individual differences, motivation, development of the so-called intangible outcomes of education, and the like which already exist in local television and radio teaching simply become more intensified in considering network programing.

Curriculum workers are extremely interested in other problems in the consideration of broadcasting and telecasting networks. The extent to which network presentations will be expected to provide for direct teaching and the extent to which they will be intended to serve as a supplementary aid to teaching are problems which need careful study. Perhaps, here again the answer is not "either/or."

The effect of education via the network will be good only to the extent to which programing takes into account tested knowledge regarding conditions essential for desirable learning. For example, teaching a course to students in medical school where a high degree of maturity and motivation can be assumed is quite different from trying to teach arithmetic to a second-grader who does not want to learn arithmetic at that particular moment. The effectiveness of network teaching, then, will depend to a considerable degree upon how well local teachers feel that they are part of the team which has a job to do in having students motivated and ready to learn that which is about to be taught by the network. The organization which I represent is interested primarily in the improvement of education and in the extension of high-quality education to all children and youth. We are not interested in doing the same old thing just as well through some other means. We are interested in continual and substantial improvement of the entire educational process. I think this point of view was well stated at the ASCD's annual conference in Cincinnati last March, where an assembly on educational television came to this conclusion:

"The unanimous agreement of the panel was that educational television is used advantageously when its primary purpose is better education—not solving the teacher shortage. Further, the experts said, an experimental attitude toward educational television must be maintained because we know so little about this medium."

I would not want to be misunderstood at this point and labelled as being one opposed to the extension of local educational broadcasting through state and regional networks. I am convinced that we can learn how to use television as a most powerful instrument in upgrading and extending education for old and young alike throughout our nation. I am simply trying to point out some of the cautions which, it seems to me, should be observed in the process of extending our efforts.

In line with the principles of curriculum development previously enunciated, I believe that we already have a well-developed and generally accepted rationale for curriculum development at the state level which would certainly be applicable to state educational broadcasting networks. In addition, in some sections of the country patterns of regional cooperation have been emerging for many years. In the southern states, for example, the Southern States Work Conference sponsored by the state departments of education and the state education associations of the southern region has met annually at Daytona Beach, Florida, since 1940 to consider educational problems of common interest and concern throughout the region. This conference has produced many publications which have been widely used throughout the southern states including a bookcase of programing practices entitled "Public Schools and Television," issued in 1958.

Another example of regional cooperation in the South has been the Southern Regional Education Board which, you will note, is represented at this conference.

In summary, I would urge that we continue to maintain adequate safeguards against diminishing local responsibility for curriculum development as we work at state and regional levels to extend educational broadcasting networks. Perhaps one of the strongest traditions in American education is that of local control of the schools in each community. In this country most educators and lay citizens have always believed that the education of American youth can best be served and our freedoms best preserved by keeping the control of education close to home; yet, as you all know, this concept has been subject to a considerable amount of challenge within the last year or so, as witnessed by various proposals for a so-called "national curriculum."

I would like to conclude my remarks with a quotation which brings into sharp focus what seems to me the most crucial question of all in relation to the effects of the educational network upon curriculum development in the local school community. This statement was made by one of our most highly respected authorities in American education in ASCD's official journal, Educational Leadership:

"Finally, if there is a possibility that television may be used to teach all pupils within a state or several states or the nation, we must appraise with care what the effects will be on our prized principle of local control of the curriculum. It is difficult, in terms of our tradition, to view with equanimity a situation in which every pupil throughout a state or the nation in the tenth grade would be taught biology at precisely the same hour and in the same way; or where one professor of history would teach all college students in American history his particular interpretation of the causes of the Civil War.

"Such a condition would be comparable to that existing in the most centralized systems of education. Local control of the curriculum has been a great safeguard against any one point of view dominating the education of students, and it has provided a highly effective means of stimulating progress by combating uniformity and undesirable standardization. Television, as envisioned by some, could well erode this principle over the years, an outcome which I personally would view with apprehension.

"It will be desirable, in my judgment, as we test the uses to which television may be put, to check persistently against the broader criterion of the kind of curriculum and teaching we wish in our schools and colleges. If some things have to be done for the sake of expediency under the pressure of numbers, let us at least recognize when we compromise with desirable standards of teaching and let us be sure that we are not sold an approach to teaching which will save dollars but will impoverish the educational opportunities of American children and youth."[1]

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[1] Hollis L. Caswell, "A Curriculum Viewpoint on Educational Television," Educational Leadership, (November, 1957), pp. 114-15.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. Harold Wigren

Educational Television Consultant
National Education Association

Before making my comments as the representative for the NEA on this panel, I would like to make clear that I am not in a position to make an official policy pronouncement for the NEA on this topic, or on any topic. The NEA's Representative Assembly, consisting of approximately 5,000 delegates, is the over-all policy-forming body of the NEA and makes all pronouncements of this sort. The Representative Assembly to my knowledge has not gone on record on the subject of educational television networks. However, at its last meeting in June, it did pass a resolution calling for "extensive experimentation and research in the more effective uses of television in education" and urging "vigorous action to develop the potential of television, both closed-circuit and broadcast, especially with reference to the possibilities it offers for individualizing instruction."

The considerations I am listing today, although nonofficial in character, are based upon the thinking at the seminars which the NEA has held recently on educational television; upon discussions of educational television at NEA conventions, departmental meetings, and regional conferences; and upon conferences with several heads of departments and units affiliated with the NEA, as well as with members of the NEA staff. I shall attempt to reflect the thinking of these groups, as well as my own thinking, on the topic at hand.

By "educational community" in this discussion, I assume is meant the effect which networks will have on learners in the classroom, upon teachers, upon administrators and supervisors, and upon the adults in the community as a whole.

Let's examine the topic briefly from each of these aspects:

1. Effects on the learner in the classroom. What are some of the things we know about the learner? To mention only a few:

a. He—not the teacher—is the central figure in any learning situation because it is he who does the learning. We—the program planners—cannot learn for him. We have too long planned "teaching" experiences from behind the camera instead of "learning" experiences from where the learner sits.

b. In the final analysis, the learner selects what will be learned. He can tune us in or turn us off, depending upon how relevant he feels the materials presented are to his own needs and purposes and to the degree that he feels the material to be learned has meaning and significance to him. No matter how useful the information may appear to the teacher, unless the learner finds it useful and appropriate, little learning will result.

c. Because the learner selects what is to be learned, the best we can do, then, is to present through television "opportunities for learning." Opportunities are all they can ever be—we can only open the door hoping that the learner will enter. When we compress into small neat packages "lessons" for transmission to learners, we may be forgetting that learning is not a product which can be packaged and mass-produced. Learning experiences need to end with a question mark—not with a period. In using television, our job is to take the lid off—to open up the subject, build a fire, get the learner "steamed up" and excited about the subject so that he might be motivated to continue learning on his own.

d. Because students learn as individuals, each in his own way—there is actually no such thing as "mass" teaching. We may think we say the same thing to all, but each individual viewer sees and hears what we say in terms of his own experience.

e. Mere exposure does not guarantee learning. The learner must internalize (make part of himself) any new learnings before he has learned. And until something happens within the learner as a result of the experience he has, he will neither remember nor use what he presumably has learned.

f. Learners need to be known in the learning situation and make a contribution to it. They must be involved.

If these principles of learning are valid, what, then, does this have to say to us regarding the effects we foresee networks having on learners in the classroom? The answer to this question seems to lie mainly in terms of the kinds of experiences we *provide on the network,* and the ways in which we see the network operating.

If we use the network (be it state, regional, or national) solely for the presentation of total courses, much as a pipeline through which the same information can be pumped into all learners in all classrooms throughout the region at a given time in formal course fashion, then we will get one effect. In this kind of situation, learners are apt to become passive receptors of impressions—sponges to soak up whatever comes out of the pipeline without opportunity to talk back or react to the "answers" given on the television screen. If, however, we use the network as a vehicle for presenting a wide range of learning opportunities in a "fielder's choice" type of fashion from which learners might choose, then there will likely be still another effect. The learners in this situation would have freedom to select and learn to make choices. They are helped to see themselves as reasoning persons capable of participation and self-direction. Learners, then, come to believe they have the kind of mind the teaching methods imply. The choice is clear—we have the opportunity through networks to go one road or the other: Offer the same diet in army fashion for all children regardless of their needs and aptitudes or their competencies, or offer a cafeteria selection providing many types of learning opportunities to take care of individual needs and problems. To us, the challenge of the medium lies in the latter method where the network can bring a rich variety of learning opportunities. We would hope that networks would be used to expand the classroom—not to do the job the teacher is already doing. We are opposed to straight-jacket curriculum experiences. More flexibility—not less—is needed.

It is our feeling also that networks should occupy a unique role in relation to the total resources picture. Some experiences the classroom teacher can best provide; others can best be provided on film or through other instructional resources; other experiences can be brought to the classroom via television tailor-made by the local district; still other experiences might come through the network. Much clear thinking has to be done to determine who does what—who can best provide which experiences. There seem to be certain unique contributions which a network can make:

a. If a network were to be used to share resources (both human and material) on a wider basis throughout the region, or between one region and another, the possibilities for enriching the curriculum would be limitless. As an example, the opportunity of sharing Robert Frost in Burlington, Vermont, with children in New York City or Hartford, Connecticut. Or conversely, the opportunity of sharing a field trip to the Children's Museum in Brooklyn with children in Maine or Vermont, presents a new dimension in sharing resources.

b. If a network were to be used to bring current events in the region to the classroom quicker and with more vitality than would otherwise be possible—

c. If a network were to be used as a means of sharing a teacher with another region where no teacher were available—

d. If a network were to be used as a means for people in a region to look at their own problems and decide on a solution in a town-meeting type situation—

e. If a network were to be used to acquaint viewers with the resources of their region—

f. If a network were to be used as a means of stimulating local effort in curriculum improvement, rather than just to present the final product—

Then, new dimensions open up in our future uses of network ETV.

2. Effects on the teacher in the classroom. We have heard much in the last year or two regarding the value of "team-teaching"—the television teacher and classroom teacher working together. This concept has real merit and has become much cherished by all of us. We cannot help but raise the question, therefore, "What happens now to the concept of team-teaching with the arrival of network broadcasting?" We already know how difficult it is even on the local level to keep the television teacher and the classroom teacher working together at every step of the way. The difficulties of keeping such teamwork intact would be greatly increased if the two were to be separated by hundreds of miles. Continual interaction is imperative if high-quality learning is to result—constant feedback between television teacher and classroom teacher is essential if the classroom teacher is to have part in the planning of what is to be telecast and is to understand the objectives of the program. Even though team-teaching is desirable, the main responsibility for leadership in the classroom lies with the classroom teacher—not the television teacher or the television program. (Personally, the pattern of use which I feel is most justifiable and defensible is that in which a smaller portion of the teaching load is carried by television—and the major by the classroom teacher.) As an example, a series recently underwritten by the Center in English literature in which a half-hour weekly program brings to the English literature classroom those elements which could not otherwise be available to them, seems to make good sense. The television program must become an integral part of the curriculum.

The teacher must be able to look upon network television as a source of many rich learning opportunities and not as an arranger or intruder in his classroom. In the last analysis, it is the classroom teacher who decides to turn the television set on or off. It is not enough to plan programs for teachers; we must plan with them so that television can make its maximum contribution to the day-to-day classroom situation. This will not be impossible with network television, but it will become more difficult.

3. Effects on Administration. Here again network television opens up possibilities and presents, at the same moment, certain problems. The possibility in in-service education programs for teachers of bringing outstanding consultants to many school faculties in a region at one time seems to be a good use of that consultant's time and experience; the possibility of sharing demonstrations of good teaching throughout the region or state; the possibility of sharing good practices in various areas, such as in the significant uses of materials; or the possibility of presenting several points of view on a given problem facing teachers in a region—all of these seem to suggest that other exciting uses of network television in the in-service education of teaching personnel are possible. Wherever such experiences are planned, however, they must be pertinent and meaningful to the local situation.

Some administrative problems of grave importance arise, however, when we anticipate presenting in-school experiences via television on a regional basis:

a. The problem of scheduling. Schools are like individuals—they do not run on the same time schedule. Thus, a program which might be best aired at one time for one school may not "fit" all schools in the region. We have already encountered this problem at the local level and it will become even more serious at the regional level.

b. The problem of curriculum content and continuity. The curriculum varies from one city or locality to another. All students, for example, do not study American history at the same grade level. Some study it in the fifth and twelfth grades; others in the fourth and tenth grades. Unless all schools in an area are forced into the same pattern, it would be difficult to schedule experiences that would mesh into the curriculum at the particular time they are needed. Carried to an extreme, it would mean a national curriculum for all schools with an accompanying loss of local initiative and control of education. This would meet with widespread opposition throughout the nation. When the time comes that the control of experiences children have in school would no longer be decided by the classroom teacher or administrator on the local level, but by those on a regional or national level, then we are running counter to the Constitution, which squarely places the responsibility for education on the state and local community. At all times, educational television programs should be immediately responsible to their viewers.

c. The problem of responsibility for programing. Because we are con-concerned with televised education, it is axiomatic that educational television should be controlled by the schools and be responsible to curriculum leaders as is any other tool used in the instructional program. Those responsible for the curriculum must also assume responsibility for educational television, lest the curriculum be determined by television rather than television being used to implement the curriculum.

Because of these problems, it would seem highly important that the administration of television and the determination of what is televised be centered at the local level using network offerings as resources to extend rather than to supersede.

4. Effects on the adult community. It is in this area that we feel network programing can make its greatest contribution. Unfettered by schedules, curriculum correlation, lack of flexibility, network programing can move ahead, bringing the richest and the best in the region for the benefit of all. The Center has already made a magnificent contribution to this area on the national level; there is certainly need for more programs of this type to be developed. In fact, informal programs of a regional character during out-of-school hours could well be aired for children and youth as well. The potentialities of a state and regional network for adult programing become limitless. Programs, thus produced, could be shared in turn with other regions so that better insight and understanding of problems faced by citizens in one area might be shared with citizens in other regions of the United States.

SOME CRUCIAL QUESTIONS

In summary, we should like to raise some questions which we think are crucial in any consideration of state and regional telecasting:

1. What do we want to do with such networks? And in what ways do we want to do it? My personal viewpoint: If they are to serve the wider adult community or provide regional experiences for classrooms on a resource basis, then we feel such networks would be feasible. Otherwise, we are dubious.

2. What unique functions do we envision the network providing? My personal viewpoint: If a network supplements the local station and allows it ample opportunity to do its own local programing to meet the needs of the particular school community it serves; if it is to share resources which could otherwise not be shared for classroom use; if it does things which the classroom teacher on the local level could never do; if it tends to encourage local production and involvement at the local level, then the network will be serving a role which is unique and will be meeting a need which is not now being met. The educational community is more likely to endorse the concept of network broadcasting if its unique contributions are made known and adhered to.

3. The most crucial question of all: Do we really need a "live" network to do these things or could the same purposes be served just as well—or better—by a videotape exchange for programs produced at the local level, similar to that now being administered in educational radio by NAEB? What is it we have to say that is so urgent that it cannot be said on tape? My personal viewpoint: Now that every educational station has its own videotape recorder (thanks to the Center), a tape exchange would seem to present an ideal arrangement. It would allow for flexibility which is not possible in "live" network broadcasting. Teachers, for example, would have the opportunity of previewing programs before using them and thus be in a position of selecting the experiences their classes are to see, choosing programs which meet the needs and purposes of their classes at the particular time they are most needed. From where we sit, a tape network would accomplish practically all the advantages of "live" networks and at the same time overcome many—if not all—of the limitations which "live" network programs create.

4. How can we preserve the team approach to teaching under the network system?

5. What can we do to insure local programing to balance network programing? My personal viewpoint: Finally, we should like to re-emphasize one point which seems fundamental: the need to redouble our efforts to see that local educational television

stations maintain a strong programing service at the local level. A network will succeed only in so far as the local affiliates are able to render the kind of service they alone can perform. There is danger that in our enthusiasm for the network idea that we will tend to eclipse and even neglect vital sources of programing in each community. A network can take such programs and give them visibility in a larger community setting. When the time comes that programs are "manufactured" at a central source for distribution throughout a large region (be it regional or state or national) we may be in danger of becoming insensitive to the peculiar and special needs of viewers who form our day-to-day audiences.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

The Very Reverend Celestin J. Steiner, S.J.

President
Catholic Broadcasters Association
President
University of Detroit

May I say that, while I am the President of the Catholic Broadcasters Association, I am not presumptuous enough to hold that I represent them. Not a single one may agree with me in anything I am going to say, because, frankly, I didn't consult them.

The Catholic Broadcasters Association is a national association eleven years old. Only as of last year did we have any paid personnel. So we then began to think of it as a revitalized association, and when we used the word "Catholic" Broadcasters Association, we would not like to give the impression that there is a Presbyterian or a Methodist or a Catholic way of handling a camera, for example, but what we mean is that we have in our membership those of the Catholic faith who either are responsible for and sponsored as diocesan priests for the religious broadcasting in their area—or we understand that in a different way the Catholic broadcasters are also composed of such persons who broadcast under Catholic auspices. Here you would have all of the Catholic educational institutions on the elementary, secondary, and higher education level.

Just by way of explanation.

Now, I am grateful, more grateful than I can express here for the privilege of having a voice on behalf of the parochial and religious education in a conference on essentially public education.

Ideas and images play a major role in fashioning the culture of a nation.

Radio and television are extraordinarily effective media for the communication of ideas and images.

As an American citizen, as an educator, and as a clergyman, I have a responsibility for the culture of America; hence my interest in radio and television, and in this conference.

The University of Detroit began to use television as a medium of instruction seven years ago. It was not until 1957, however, that the University offered a sequential and complete curriculum of television credit courses leading to a bachelor's degree in its Liberal Arts College. Students were thereby given the opportunity of carrying from three to twelve credit hours of courses in sequential programs presented on television. Students taking these courses for credit came to the campus for discussion, counselling, and examinations.

Televised instruction has been continued on this basis from the University of Detroit studios for the past two years, providing the courses required of freshmen and sophomores. The facilities of both Educational Station WTVS and WJBK-TV, Detroit, have been utilized for these degree programs.

Because our experience is so largely with instruction via TV, I will confine my observations to this aspect of educational broadcasting in relation to state-wide or regional networks.

Regional network television may be understood and effected in the following ways: (1) Live or videotaped television programs originating from one or more master stations and made available to such channels as are capable of reception and transmission. (2) Videotapes made available to as many channels as there are in any given region.

I omit consideration of kinescoped programs on the assumption that these are becoming outdated by videotape.

Regional educational radio and television networks may be a tremendous asset to the education of American youth and the people of America and the world. I suggest, however, certain cautions in regard, at least, to credit courses.

Basic to our philosophy of education by television is the concept that, in addition to on-the-air instruction, students should be brought together as a class on campus, at weekly intervals, for face-to-face discussion, conference, and testing. The discussion groups are limited to not more than thirty students in order that each may participate actively in a give-and-take learning situation. The services of additional faculty members are, of course, needed to provide this well-rounded approach to the learning process.

We have created, therefore, faculty "teams" which utilize the skills of the studio teachers as well as the aptitudes and counsel of those who lead discussions, provide individual assistance when needed, and reinforce the main concepts presented in the telecast with ideas and information that supplement the original lesson.

Naturally we are concerned with the preservation of the "team" concept of instruction when the question arises as to whether our kind of instruction can be extended to a network of educational stations to reach students residing throughout a state or perhaps an entire region.

Obviously, it will not be possible to assemble these students on a campus or any other single, central meeting place. The only solution would seem to be one wherein students and faculty meet at a series of off-campus assembly rooms where supplementary instruction and testing is possible. Essential to this arrangement, however, will be an enrollment sufficient to make the plan economically feasible. You can't send a valuable teacher three hundred miles to meet three, six, or even a dozen students once a week.

It would seem, therefore, that limitations must be imposed on the teaching of a single telecourse offered over a state-wide network while preserving the "team" concept. Credit could be offered only to students who could be transported to assembly rooms where their numbers would be sufficient to make the plan practical.

If, however, a full curriculum of credit courses could be presented via television, permitting the enrollment of a considerable number of students in a degree program, the plan might become eminently feasible.

We are suggesting here what is, in effect, a junior college—but one without a heavy investment in buildings and other expensive facilities, because the number of suitable classrooms needed would be comparatively few. This would seem to be the best plan for state-wide or regional television instruction.

Another alternative would be to abandon the "team" concept, assigning the full pedagogic responsibility to the TV studio teacher. This is a practice extensively employed in presenting such college-level instruction as is provided by "Continental Classroom." Credit may be obtained from those colleges who recognize the professional competence of the teacher and the validity of the course simply by the payment of tuition as evidence of enrollment.

I have another caution in regard to state and regional educational television:

Many educators hold that the strength of American education is in its diversity and that colleges and universities for all that they have in common, also have important differences. For example, the University of Detroit is a privately supported university, in fact the only one in the State of Michigan. Today, and through the years, students through their tuition and fees, faculty through special dedication, and alumni and friends provide educational opportunity for American youth who are willing to make sacrifices for a University of Detroit education because it is different. What makes the difference? Many things. Philosophy and theology as coordinating, integrating, and illuminating disciplines; the philosophical and theological viewpoint of faculty who teach and counsel. These and other factors make a distinctive educational philosophy and environment that is characteristic of University of Detroit education. These differences are real and important. Can they be preserved in the regional network plan of educational television? The answer to this question may lie in the manner of financing and ownership and control of the networks. If the network is to be financed and owned by government, is there not a very real danger of government monopoly, and consequently undesirable uniformity of education?

If private institutions or groups of institutions, such as those cooperating in the Detroit Educational Television Foundation, are to be granted the option of being an original network source, whence will come the funds for these private institutions? If government funds are made available, what will be the restrictions regarding programing? For example, would the University of Detroit be permitted to broadcast its courses in theology and philosophy? Please do not misunderstand me. I am convinced that educational radio and television provide us with opportunities unprecedented in the history of the world. I believe that education by radio and television should be made available to every man, woman, and child in our nation—without sacrificing, however, any real values in our traditional American education.

What, then, do I positively advocate? First, I suggest that encouragement and support be given to the production and distribution of videotaped programs, that these be made available to existing educational channels, and that new community stations be established where they do not exist.

If, however, it is decided that regional television should take the form of a master station from which live or videotaped programs will be made available to such channels in the area that are capable of reception and transmission, then I urge that the ownership and control of this master station be vested in the existing educational television stations and foundations in the area, public and private. Only in this way will all the values in American education be safe-guarded and a monopoly of government education be avoided.

While the views I have expressed are the result of experience with direct instruction via TV, they are really based on the nature of television and freedom of education—hence their validity for all educational television.

I am grateful for the opportunity to participate in this conference. I hope that I have made some contribution to the discussions that will follow, and of course, to the final recommendations.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. O. C. Aderhold

Member of Executive Board
Land-Grant Colleges Association
President
University of Georgia

The Land-Grant College Association has a history of keen interest in the use of radio and television broadcasting for education. The land-grant institutions were among the first in the educational broadcasting field, and the Association was among the first of the national organizations to take an active and continuing interest in educational broadcasting.

The Association has had an active committee since 1925, first as a Committee on Radio, later as a Committee on Radio and Television. The first report of this committee indicated that fourteen member institutions were active in educational radio broadcasting over their own stations with power of 500 watts or more. One of the first acts of the new committee was to testify before a Congressional committee in favor of legislation which would protect bands for educational broadcasting, and to urge the Department of Commerce to do the same by administrative action.

The American Association of Land-Grant Colleges and State Universities was one of the original members of the Joint Committee on Educational Television. This Joint Committee carried on the battle for reservation of ETV channels in the early years of struggle by presenting testimony before the Federal Communications Commission and the Congress on many occasions. The Association is at present a member of the Joint Council on Educational Television. An active Committee on Radio and Television is headed by President Novice G. Fawcett, of Ohio State University, who is unable to be here today.

The Committee on Radio and Television in its last report to the Association of Land-Grant Colleges and Universities stated that in 1958 members of the association operated or had under construction 50 broadcasting stations (10 AM radio stations, 25 FM radio stations, and 15 television stations. Three of these are commercially licensed and two are assigned UHF frequencies). Land-grant institutions in Alabama and Florida were constituent parts of state-wide educational television networks. At least 20 institutions were utilizing closed-circuit television systems in a variety of applications which ranged in scope from veterinary medicine to the department of mathematics.

Obviously a record of this sort indicates a keen and continuing interest on the part of land-grant institutions in radio and television. And it is an interest wholly in keeping with the land-grant concept. Institutions which have grown out of this concept recognize responsibility within their own states for campus instruction, research, and state-wide programs of extension work in agriculture and related areas, and broad programs of continuing education for adults in all professional and occupational fields.

Historically, the land-grant institutions have sought to use every appropriate means of communication for reaching the widest possible audience. Today, with a heightened sense of the importance of education, and with a general recognition of crisis in education, we are taking a new look at all media available as "devices which, properly employed in the educational process, offer considerable potential for the more efficient deployment of instructional staff, for increasing the efficiency and the impact of the lecture and demonstration, and in many subject matter areas for upgrading educational quality."

As I have already indicated, land-grant institutions have been in the forefront with radio and television. In the period from 1953 to 1958, a total of 21 land-grant institutions reported offering 148 televised courses on both educational and commercial stations, as well as by closed circuit. Where the number of courses offered in 1953 was only 3, there were 49 offered in 1958.

The offering of single courses and groups of courses by television has provided an opportunity to look at some of the advantages and some of the problems that we face in adopting television as a tool for education. And it has brought us to the point that we may even consider the possibilities of linking our resources through networks.

To look at the effects of network television on the educational community of the land-grant institutions, we must of course bear in mind the threefold objective of teaching, research, and extension.

1. Already, we are finding that the problems of offering credit courses by television are complex, but we are also finding that programs can be enriched, through the use of television. In one instance, a basic course taught by a senior professor has been put on closed-circuit television. With the aid of teaching assistants, this noted teacher has been able to triple his audience of students. This course is the kind which is offered in many colleges and universities. The closed-circuit television professor is a recognized authority in the field. Network television with skilled assistance would make it possible for great numbers of students to have contact with this man. The opportunities that this type of teaching opens up are suggested by Robert W. Sarnoff, chairman of the board of the National Broadcasting Company. Mr. Sarnoff was quoted recently as pointing out that if Dr. Harvey White, one of the best physics teachers in the country, were to divide his present television student body into five standard college classes a day, teaching them in the usual way would take more than 1,300 years. Dr. White's "Continental Classroom" is programed over 149 stations and is offered for academic credit in 250 colleges and universities.

A network of television offerings which made the best use of the strongest resources of the member institutions would in effect hold out the promise of generally improved instruction. When individual stations in the network would be receiving programs from other points of origin, each production center could then devote more time, energy, and imagination to the program it feeds to the network.

Formerly we have thought in terms of bringing outstanding men into the classroom or the lecture hall, visiting professors, and even regional classes to which students are transported, so that we might make the best use of our richest resources in teaching. Educational television networks would remove the need for transporting teachers and students and would simply transport the message to be exchanged.

2. Where research is concerned, we find today that although greater numbers of people are interested in research, and although great progress has been made in cutting the time-lag between laboratory and field and shop, television offers us a valuable medium for reaching more people more rapidly. Today, in order to properly move from findings to implementation, the most commonly used device is a demonstration. To present the results of fertilizer tests on grain, for example, a demonstration would move a maximum of 100 farmers over fields by foot. Unless the sun were just right, the wind just right, and the many other variables of such a situation in balance, much of the effect of the observations would be lost. But, with television, 100,000 men could witness the same demonstration, and actually see it in greater detail and to better effect than if they were on the ground. Regional networks would make it possible for the richest resources from laboratory and experiment station to be brought to large numbers of people.

3. In service to adult population, with programs of continuing education, regional networks offer unusual opportunity. Most land-grant institutions today find it impossible to meet the demands for continuing education which come from adults in all walks of life. Greater numbers of these people who are seeking enlightenment could be reached with fewer and better-qualified teachers. Common regional problems—agricultural, sociological, economic—could be approached with educational programs which would utilize the finest specialists.

Pioneer programs in isolated instances on educational and commercial TV have shown what can be done in the fields of homemaking, art, literature, and music with adult viewers. Medical science and veterinary science have pointed the way to what can be done in professional fields with television transmission. Not only can more people witness actual demonstrations, but they can see and hear more than they can under other conditions.

While television offers a challenge in the field of classroom teaching, and in the area of transmitting research findings to professional people, it offers almost unlimited opportunity in the general area of continuing education. Already, thought and experimental work are being devoted to combining television, reading, and discussion in programs that will bring a wealth of resources to the interested adult. As with classroom teaching and research, what can be done on one station can be magnified with network programing.

Diversity is often called one of the great strengths of higher education in America. The land-grant movement is a unique contribution by the United States to the idea of higher education. Certainly most of our land-grant colleges and state universities today offer a wide variety of courses, and each institution has its specialists whose work is not duplicated elsewhere in any given region. Network television offers the potential of putting this diversity to larger and more extensive use. In any region there is undoubtedly a larger audience than one institution for the most limited specialty.

There would, of course, be problems to face. Capital outlay is one. Financial problems of day-to-day operation are considerable. There would undoubtedly be administrative, academic, and possibly other problems which would prove difficult. In general, however, most of these problems are those which would face any institution of higher education, and not land-grant institutions alone.

The record shows, I believe, that the land-grant institutions have been willing to face problems of this sort whenever their solutions might lead to better-quality education, expanded educational service, and increased cooperation among institutions.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. Finis E. Engleman

Executive Secretary
American Association of School Administrators

My organization was active also with the Joint Council on Educational Television and still persists in that work. My remarks will be given from the point of view of the public school administrator.

First of all, I wish to express my belief that the medium of television has tremendous potential for education as a means of communicating meanings, ideas, and concepts. Possibly its greatest handicap lies in the exaggerated claims of the overzealous or from those who neither know television nor education. Its power and possible influence are so great that the best minds should be turned to directing it, studying it, and keeping many of its resources as part of the public domain. It may be slipping through the fingers of the public. It impinges on the lives of too many people not to be in considerable measure in the hands of all the people. Its power for good or evil demands that society as a whole and educational authorities in particular give it their continuous study and attention.

As to the effect of educational television networks at the present time, I would say that they are as yet sporadic, varying in quality, but nonetheless considerable in scope. Possibly it is wiser that I not try to appraise the effects which are now discernible but rather to discuss a few problems that relate specifically to the school administrator as he concerns himself with his particular job of giving over-all direction and leadership to the school community program.

It is well that we recognize certain conditions that prevail. The board of education lays down certain educational objectives. It adopts over-all curriculum patterns for each age level and provides certain resources to promote this total educational program. Likewise, the state education agency and the legislature often outline the areas to be taught in the schools, grade by grade. All this is part of the American tradition. The administrator and staff of local and state systems have the responsibility of providing the environment and educational experiences to bring about the learnings in the prescribed courses of study. Likewise, the school day, week, and year are organized to these ends. The instructional staff is the chief instrument in the organization to judge, within the organizational structure, what experiences happen to whom and when.

The regional or state television network, therefore, will have the most wholesome and useful effect when it is geared to the what and the when of the learnings which are being sought in the individual school system. Thus the content learning of any grade is furthered to the degree that a given television presentation has immediate relationship to the particular curriculum job at hand, together with an identification of just what aspect of teaching he can and cannot do. It is not, as yet, the prerogative of a television network to determine the school's curriculum. It seems clear that organization of television subject matter should be tied closely to the day-by-day planned curriculum of the school.

Educational television facilities and those operating them are resources to be used by those legally charged with operating the schools, not forces to take over responsibilities assigned by society to others. Thus coordination, timing and flexibility seem to be desirable and necessary qualities. These have in large measure not yet been achieved. Possibly the next big step is that of support—financial support—by the districts themselves which are served.

Since American education at its best is tailored to meet the diverse needs of the individual at any time and with great ranges of ages and stages of development; since school districts and states operate with rather complete autonomy; and since there is little likelihood that a national or even regional curriculum will soon emerge, the problem of coordination is compounded. Surely legal responsibility should not be multiheaded for the same pupil.

A somewhat inflexible instrument such as a television network, and complex and exceedingly diverse educational systems and teaching methods, put real limits on what educational television can accomplish. The limitation—to date at least—of the number of frequencies that can be used places severe limitations on the areas of learning that can be taught at a given time over television networks. Furthermore, the hundreds of areas of learning attempted in a school system and with children at all stages of learning, from kindergarten to grade 12, suggest the physical limitations of one communications medium such as television, particularly open circuit. I shall not mention again the limitations listed by Dr. Fuller a few moments ago. His list was quite complete.

All this, coupled with the fact that there are hundreds of autonomous free-wheeling school systems depending in many cases on a single network, adds to the difficulty of coordination and coverage.

Nevertheless, agreements on time, programs for aspects of some subject areas and for some grade-age groups, are within the realm of possibility. The fact that the autonomy of a school district permits freedom of choice and freedom to make individual adjustments is a helpful factor in many if not all schools in a region. Furthermore, the lack of teaching personnel for certain emerging curriculum areas—such as the culture of the Far East—suggests the need for instruction by television where one specialist teacher may serve several school systems, since such specialist teachers may not be readily available to individual school systems.

Possibly the greatest need is leadership which has faith in the medium of television and which will inspire mutual respect between television officials and school administrators. If in any state or region such leadership can pull together both school and telecasting officials and develop cooperative program planning and agreement on ways for coordinating both agencies, phenomenal results can accrue. The complexity of the problem can be overcome if limitations are frankly accepted and opportunities are patiently developed into coordinated action. There is no one pattern of leadership; neither must it spring from a single source.

If the effects are to be commensurate with the potentials, however, school administrators, curriculum experts, and teachers must join hands with the officials of the networks. First there must be insights as to the value of such a team. Second, the limitations need to be recognized. Third, cooperative and coordinated programs and schedules need to be developed; and fourth, earnest tryouts and evaluations should prevail where the role of both staffs become clearer. Until this is done, the effects will be limited and sometimes unworthy of note so far as the organized educational purposes of the school are concerned.

Another effect, as yet largely neglected, is the area I choose to call professional and vocational horizons, or a specialized form of adult education. I refer to programs that are prepared for groups with like vocational pursuits and beamed specifically at them. The material presented would be frontier concepts and usually based on the most recent research and practical-experience findings. Half-hour periods each month might be assigned to such groups as dentists, doctors, farmers, nurses, teachers, pharmacists, auto mechanics, and the like. Although some will contend that such programs are too highly specialized, it may also be contended that such is the nature of much of education and must be so conceived if best effects are to be obtained.

Furthermore, I would mention the effects of the unorganized, yet quite significant educational effects of network programs designed to achieve independent educational purposes and to supplement the organized curriculum of the schools. The film, slide, and audio record makers have made good use of this approach. This type of television may most likely get best effects and results when operated during non-school hours. After all, the child and the adult have a lot of hours when they are neither working nor sleeping. Thought of the most serious kind, however, needs to be given to what knowledge is of most worth when educational programs for any audience are being planned. Furthermore, like the extracurricular programs, they, too, should complement and relate wherever possible with the organized content of school programs. Here, too, a planning and publicizing team of telecasters and school people should have a scheme for pooling their resources.

It appears to me feasible for the subject specialists of a given school to isolate those complex and difficult units where teaching materials (such as specialized laboratory equipment) or demonstration equipment simply can't be moved into a classroom—for example, a cyclotron or the interior of an atomic power plant.

Once the difficult teaching areas are identified and catalogued, then the television production team would go to work. Once these steps are accomplished, the telecasting forces and the school authorities are in position to determine time schedule for either out-of-school or within-school situations. Furthermore, a closer linking of educational television and sound film will multiply results.

And finally, the producers of educational television programs have made many contributions to the art and science of teaching. Surely more people, including teachers, have a better notion of the complex, difficult task of teaching than ever before. Since television teachers insist that they can only successfully teach a relatively few classes per week, the classroom teacher begins to realize the time needed to prepare a lesson.

Perhaps they have overestimated the power of the human mind to perceive, at least in terms of time. Perhaps they are demonstrating that the speed and efficiency of learning can be increased greatly. At any rate, they dare not neglect giving continued concern to methods and materials if best effects are to be obtained. Possibly the greatest contribution and most lasting effects yet made by educational telecasts has been the improvement of instruction and the in-service education of teachers, particularly in those aspects of teaching which are primarily demonstration, exposition, and lecture.

I hope America will not see educational television arise as a conflicting, paralleling, and overlapping authority for the curriculum of the public schools.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Dr. A. W. Vander Meer

Representing

The Association for Higher Education
of the
National Education Association
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It is a cliché to say that higher education is in a period of crisis; nevertheless, this is true. A series of complex social and philosophical changes in this country, and the foreign-based, world-wide threat to the democratic way of life posed by the spread of Communistic ideas have given urgency to the work of those of us who are engaged in higher education. We have been continually engaged in a re-examination of our objectives and our continuing study and appraisal of the organization and procedures employed in our work, and we now have much more reason to attack this work with vigor. In my opinion, it is hardly possible to overemphasize the seriousness of the situation faced by the people of this nation.

The colleges and universities are the agencies upon which our people depend for the discovery and dissemination of knowledge and for the cultivation of minds of the leaders on whom the burden of meeting the foreign and domestic challenges rests. The organization and the procedures that may have been suited to the task of higher education in the first half of this century simply cannot be depended upon, without modification, to meet today's test of survival. My discussion of the effects on the educational community of the establishment of state and regional networks for educational broadcasting, therefore, will be placed in the framework of conditions requiring the most creative thought and the most sound decisions in higher education, together with the possible implications of regional broadcasting networks for these conditions and decisions.

All those concerned with higher education can be divided into three groups: the students themselves; the teachers, research workers, and administrators in colleges and universities; and the public served by institutions of higher learning, that is, the rest of society. At this point I wish to discuss only the first two of these three categories, although there is considerable evidence that the image of higher education held by the general public is undergoing some rather interesting changes.

At the present time, institutions of higher learning are undergoing a period of transition in enrollment which is similar in kind if not in degree to that which was the most notable characteristic of the public high school during the first half of the twentieth century. At a time when the absolute numbers of people in the college age bracket is increasing, the proportion of these numbers who seek entrance to higher education is also increasing. A few decades ago, only about one out of ten people of college age sought to enter an institution of higher learning. In some states this proportion has already increased to 50 per cent. As a result, colleges and universities are facing the prospect of doubling and even tripling enrollments in the decade of 1960 to 1970. Penn State, for example, expects 15,000 students to take up their studies at the University Park Campus next week. In 1970, 25,000 are expected. Fresno State College in California enrolls 6,000 students at present; in 1970 they expect 20,000.

The problems of dealing with resident students at the graduate and undergraduate level is a "numbers game" of staggering proportions. At the same time, however, in response to a growing realization that higher institutions have a serious responsibility for continuing education, colleges and universities are feeling increased pressures from within and without to extend the services that they offer to adults of all ages and all walks of life who wish to continue their studies on an informal basis. Dr. Lyons of Harvard made this point yesterday. The rapid increase and discovery of new knowledge, and the social and technological changes that are taking place so rapidly in our society demand that a sizeable proportion of the adult population receive intellectual leadership in continuing their studies, both for cultural reasons and for vocational advancement far beyond the terminal point of a degree program. People are turning increasingly to colleges and universities to supply these services.

There was a time when the student clientele of a college or university could be located geographically by the boundaries of the campus. The trend today is to take higher education to the student in addition to permitting the student to come to the campus to receive a higher education. President Walker of Pennsylvania State University was abreast of the times when he offered, earlier this year, the Penn State System of Commonwealth Campuses as an organizational basis for a system of post-secondary education in the Commonwealth of Pennsylvania.

The demands for wider geographical distribution of the resources of higher institutions, the obligations for continuing education, and the increased numbers and proportions of people at college age to seek entrance to higher institutions add up to an educational task of staggering proportions. If the numbers of people of "college instructor age" were keeping pace with the growth in numbers of students, the problem would not be so difficult. Unfortunately, however, precisely the opposite is the case. The decade that should have produced the instructors and professors for the classrooms of 1970, that is, the decade of the 1930's, was the decade in which the population of this country showed the smallest increase in absolute numbers during the twentieth century. We are faced, therefore, at one and the same time, with a widely increasing student population, and a distressing "low point" in the population from which instructors can be drawn to serve that student population.

The implications of state and regional ETV networks for helping the higher educational institutions to meet the needs of a clientele for post-secondary education that is changing both in quantity and in quality are almost too obvious to list. Television is, if nothing else, a tremendous channel for the distribution of information and ideas. The educational "reach" of the instructor is, thanks to television, no longer restricted by mechanical factors. This means that the only limit to the numbers of students that a scholar can reach are those imposed by psychological distances and educational considerations. These latter considerations are, of themselves, no mean area for study and research; but the removal of the mechanical impediments to increasing the scope of the teacher is in itself a tremendous stride forward. State and regional networks promise to be one factor in meeting the changing needs of higher education.

CHANGING AIMS OF HIGHER EDUCATION

A primary aim of the college and the university has traditionally been to serve as the guardian of the funded cultural capital of society; to serve as a cultural storehouse and as a transmitter and disseminator of knowledge. In past decades, the emphasis in American education has seemed to move in the direction of the transmission of knowledge, as opposed to that of making knowledge available for the self-directed learning of the scholar. The sheer weight of numbers of students would, in itself, be sufficient to cause those of us who are concerned with higher education to consider shifting the emphasis in the direction of encouraging more independent study. Actually, however, the reasons that have brought about the greater interest in continuing education have also served to motivate this same shift in emphasis.

Similarly during the early decades of this century, a somewhat bitter controversy raged between so-called "capital E" educators and the rest of the university community—concerning the importance, relatively speaking, of content and method. It seems to me that the argument has now largely been resolved, with the general realization that the purpose of method is to enhance the immediate learning of content, and more particularly to enhance continued independent study of content. Content cannot be presented in a vacuum; some method must be used. The important thing is that the method should exploit the inherent power of the content to motivate the learner to continue his studies, to develop the skills necessary for independent, life-long study, to make applications of what is learned, and to continually and creatively reorganize his learning and his experience in terms of the developing situations that he meets.

Television, whether it be network broadcast television or closed circuit, implies to many in the educational community a retreat to the type of aim for higher education that places its emphasis on the transmission of knowledge to the detriment of the aim of encouraging and stimulating independent, self-directed learning. It is my personal belief that far too many examples of the current use of television for educational purposes justifies this suspicion. I feel equally strongly, however, that television need not be used exclusively as a vehicle for the transmission of knowledge in this way.

In the final analysis, while it is undoubtedly true that a degree of the kind of intellectual contact possible only in small group instruction is essential to the kind of higher education demanded by the present situation, it is probably completely untrue that only by small group instruction can a proper higher education be attained. The problem is twofold: first, to use the distributive aspects of the television channel for dissemination of knowledge in such a way as to stimulate continued learning; and, second, to employ TV facilities for increasing the "reach" and contact of the individual instructor in such a way as to free many instructors for individual contact with students. This obviously implies a kind of division of labor as between mass instruction and individual instruction or small group instruction. To some inhabitants of the "ivory tower" the concept of division of labor is anathema. I feel, however, that it is inevitable, and that regional network TV is an integral part of it.

A second traditional primary aim of higher institutions is that of discovering knowledge. Needless to say, this aim has been increasingly met, and the pressures for doing even more in this direction are tremendous. To meet the demands for discovery of knowledge through research by progressively withdrawing the best minds from instructional tasks is a solution that educators are reluctant to adopt. Yet all too often this has been precisely what has been done. Television, particularly regional network television, may offer a partial resolution to this dilemma, through helping to increase the productivity of institutional personnel in teaching, and thereby freeing more personnel for research.

In considering the possible effects of regional television networks for educational purposes on the community of higher education, it is necessary to place educational television in its proper perspective. In our enthusiasm, we are likely to view television as a panacea for all of the academic ills and problems of colleges and universities. The importance of educational television—local, closed-circuit, and network—can be overemphasized to the detriment of all concerned—those whose life's work is bound up with television and those whose job is to teach or to administer in higher institutions. In this connection I would emphasize the desirability of doing precisely what has been done in this meeting, involving individuals who are representative of the range of interests in higher education and in television in discussions of this kind. In this way, the considerations of what regional television networks could mean to colleges and universities can provide an additional opportunity for individual institutions of higher learning to work together toward the solution of the broader problems of education.

I would like to take a few minutes to make two additional points that stem from the prepared presentation. The first of these has to do with what we have heard a good deal about this morning, concerning assessing educational television as a channel on the criterion that it must be the best tool for the job if it is to be accepted. I think that it is reasonable to assume that the American public will ask the public school people—higher education, and at the elementary and secondary level of education—to put the shoe on the other foot occasionally and to apply the same kind of criterion to the "traditional" administrative arrangements, methodology, and materials of instruction.

I would be very much surprised if the public didn't do this, and I would also be very much disappointed in the public in its general folk wisdom, if it didn't. I think that sometimes we tend to overestimate what we already do know about learning. Why, for example, should we give such strong attention to the notion that one school teaches American history in the fifth grade and another in the sixth grade? What do we really know about principles of programing learning? Why should we toss out a new educational idea on the basis of "insurmountable difficulties" of this kind?

It seems to me that the psychology of learning has a long, long way to go, and this leads me to my second off-the-cuff point, and that is the responsibility or obligation of educational leaders at all levels to lead. It seems to me that to say that educational television has to prove itself under the current administrative arrangements; the current kind of curriculum arrangements that we have; the current image, if you please, of what constitutes a classroom—to do that is to put an unfair limitation on educational television.

It seems to me that the school people in general, in higher education and in elementary and secondary education, have a very strong and urgent responsibility to try out educational television in such a way as to make it possible for it to succeed and to make it possible to exploit its greatest advantages for education.

I think that we encounter a kind of difficulty, both on the part of administrators, college presidents, superintendents of schools, and on the part of teachers. We have a sort of cult of togetherness on the part of many teachers who are concerned with curriculum building, which cult is paradoxically based on a sort of deification of individual differences.

Let's consider the possibility that it may be true for the general mass of the public that those who share care, but let's not insist that teachers, whose job is to be flexible and to help understand and to interpret human traits and human learning, must have sharing in the most intimate sense as a quid pro quo for trying out a new idea.

This leads me finally to the last point, and I am going to make it very quickly. It seems to me that a conference of this kind has much to offer in the solution of the whole problem of regional networks, and their acceptability to colleges, universities, and public schools, in that it gives an opportunity to say that we need a kind of an administrative or policy-making commission—a national commission on educational television—to discuss educational television and to bring together the people who are advocates of television per se, those who are advocates of television within the public school enterprise, and those who have not yet really given much thought to the matter—to formulate policies, procedures and plans for the wider use of this great and important medium.

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Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Presentation by

Mr. Richard B. Hull

Representing
The North Central Association
Director
Radio and Television Broadcasting
Ohio State University

I am speaking today on behalf of Mr. T. R. Broad, the retiring president of the NCA; J. Fred Murphy, chairman of the Commission on Research and Service; and Donald Emery, who is chairman of that commission's subcommittee on television, of which I am a member. This committee has been established since 1953 because of the belief of the Executive Board of NCA that television would indeed play a major role in the future years of education, and as an accrediting association which embraces 19 states, with 3,400 secondary schools in its membership, and 401 colleges. Their concerns transcend all the concerns that have been spoken of this morning from the land-grant institutions who are members, as well as those of private schools and secondary schools.

We are particularly interested because in this area of 19 states are 20 noncommercial educational stations and 4 quasi-commercial stations. By the way, there were 5 new television stations this year; 2 more are under construction, and 6 more are planned.

The first legislature to authorize a state network was Oklahoma. This is in our membership. Nets are planned in some 11 states. You will hear more about that this afternoon. The first color television took place in Kansas, which is in this area. The first credit courses, for which our chairman was responsible, began in Cleveland, at Western Reserve, in 1950.

Briefly, our concern and our interest in this whole meeting and the results therefrom are quite broad, because the committee has taken the point of view from the outset that television is a medium; it is a device for transmitting sound and sound intelligence; and networks are an extension of that medium.

We are concerned about duplication; we are concerned about efficiency and the sharing of resources. Networks represent to the North Central group a means of economic distribution of information. We recognize also, apropos of the audio-visual people and the other people who have special means of teaching, that television is not only its own medium on which you can present live programs, but it is a vehicle for other sound and sight intelligence. It can carry charts, slides, the teacher, drama. Since 1952 we have been concerned with standards for television courses, primarily on the university level. We have been concerned next with the general effort to orient our membership in the uses of television. Consequently the scope of our current preoccupation, which will continue for two or three years, is to recognize, of course, that there is no ideal administrative association, no single method to apply the resource of television. Yet, in the context of "network," which means open or closed circuit on a campus, state, region, or city, or Hagerstown, we want to derive some general operating principles, some policy recommendations, and some definite things we can suggest as modus operandi to the people whom we try to serve.

Session V

EFFECTS ON THE EDUCATIONAL COMMUNITY

Discussion Following Formal Presentations

MR. WHITE: Because of time, I am curtailing discussion. However, I will make a very brief summation of what I believe has come from this panel this morning.

All have pointed up problems and possible limitations to the use of this medium, either as an individual station or part of a state or regional network, but all have also recognized the tremendous potential for education inherent in television.

We can and we should use this medium for supplementation and direct teaching, but only after careful planning and close integration with local classroom situations. It must be better than, not just as good as, other available resources.

The team concept should be and must be protected in any plan evolved. Television should be approached not as a means of saving money, but of improved or enriched education. We have expressed concern about controls and have shared with you a determination that this medium shall be controlled by the people themselves, and not by any special-interest group, private or public.

Because what we say here is going into a printed record, I think there is one point of information that I should clarify. Reference was made by several speakers to a national interconnected, live network. So far as I know, no one has ever proposed such a network. Certainly the Center has never proposed it. We have proposed and are determined to bring about a very flexible, fast-moving recorded network, through the use of videotape and kinescope.

The other point I would like to make is that, while tape has grabbed educational television headlines during the last few weeks, and while we are determined to use this tool to its ultimate, at the same time I know of no station that has ever considered throwing out kinescope, and we expect to be distributing and making extensive use of film for a long, long time to come.

Session VI

STATUS REPORT

Ralph Steetle, Chairman

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Session VI

STATUS REPORT

Regional Overview—New England

Mr. Hartford N. Gunn, Jr.

General Manager
Stations WGBH-FM-TV
Lowell Institute Cooperative Broadcasting Council

In New England, the development of state and regional educational radio and television networks has been severely hampered by a lack of educational broadcasting stations. This has been true not only of New England, but of most of the east coast stretching from the Canadian border to Washington, D.C., and Virginia. This area includes the great continuous metropolitan community that our social scientists now call Megalopolis. It is worth noting that some 35 to 40 million people, or about one-fifth of the entire population of the United States, reside in this Megalopolis. Here we find an unusually high concentration of the leadership in finance, industry, government, science, and culture not only of the United States, but also of the free world. It is, therefore, a matter of great concern that this section of the country has such limited educational broadcasting facilities, that such major facilities as do exist are concentrated in one or two states, and that the development of state and regional networks to make the most effective use of the tremendous resources of this region, has been so slow in emerging.

Though over the years there has been some increase in the number of educational radio stations, they have been of extremely low power for the most part and, therefore, not well suited to regional or state-wide network operation. It is only recently that this dismal picture has begun to change and that a number of institutions have started to think in terms of high-power educational FM radio which would permit the exchange of broadcast materials among a group of stations. This has been due primarily, I believe, to the promotion of the idea of regional networking which has encouraged these institutions to explore the possibilities of educational radio ownership.

In brief, it is my contention that a substantial and healthy growth of individual educational radio and television stations will become increasingly dependent upon a parallel growth of state and regional networks. It is only through such state and regional network arrangements, assisted by national program sources such as the National Association of Educational Broadcasters and the National Educational Television and Radio Center audio and videotape networks, that the program burden can be divided among a number of producing stations. This, in turn, enables an individual station to provide economically a program service of sufficient quantity and quality to attract a greater audience to the valuable educational, cultural, and informational services of educational broadcasting.

For these reasons, we have begun in New England the Educational Radio Network, which includes WGBH-FM, Boston; WRTC, Trinity College, Hartford, Connecticut; WAMC, the Albany Medical College of Union University, Albany, New York; and the educational radio station of the Western Massachusetts Broadcasting Council in the Amherst-Springfield area of Massachusetts. This four-station network operates via off-the-air radio relay, one station picking up the signal of another station, rebroadcasting it and passing it along to the next station, and so on.

WNYC, the city-owned station in New York, and WHYY-FM in Philadelphia, are also charter members of the network, but at present they are not interconnected with the other four stations. Work is in progress to see if we can establish the necessary intermediate stations or other technical facilities, so that WNYC and WHYY-FM may participate directly in network operation.

The Educational Radio Network has been in operation for about a year. To date, we have not been confronted with any major technical, program, or administrative problems. Program exchange on the network has run the gamut from the Boston Symphony Orchestra to an inter-city, two-way radio forum on heart disease with Dr. Paul Dudley White. In general, audience reaction to this programing has been excellent.

Special note should be made of the Albany Medical College station, WAMC, which is unique in that it operates its own independent medical network, using a high-power FM transmitter as the originating point for relaying discussions of medical topics from the College to doctors in the field. A special two-way radio system permits doctors gathered at designated hospitals within the coverage area of WAMC to radio questions to a panel of medical experts in the studios. Both questions and answers are broadcast to everyone concerned. It is expected that this method of medical education will be extended in the future by means of our Educational Radio Network.

The success of our four-station network has encouraged us to design and plan for a much larger regional network that would provide educational radio service to an area stretching from Montreal, Canada, to south of Washington, D.C. The major problem in the creation of such a network is the establishment of a number of educational radio stations with sufficient power and FM frequencies to permit off-the-air radio relay from one station to another. The growing shortage of suitable FM frequencies in this part of the United States has forced us to make every effort to secure the necessary funds to stimulate immediately the development of the network so that the possibility of this major educational radio service will not be lost—namely, a network extending from Canada to Burlington, Vermont; Albany, New York; Amherst and Boston, Massachusetts; Durham, New Hampshire; New Haven, Connecticut; New York City; through New Jersey to Philadelphia, Baltimore, and Washington, D.C.

The story of the development of state and regional educational television networks in New England is similar to that of radio. While some years ago elaborate statewide plans were proposed in Connecticut and neighboring New York, there have not been any actual network operations in New England until this past year, when the first interstate educational television network was begun with the establishment of an off-the-air relay between WENH-TV, Channel 11, at the University of New Hampshire in Durham, and WGBH-TV, the Lowell Institute Cooperative Broadcasting Council station in Boston. Programs currently being exchanged on this New England Educational Television Network include most of the adult programs originating live from WGBH-TV, as well as several programs for the adult audience originating at WENH-TV. In-school programing is scheduled to begin this fall, with New Hampshire taking from Boston sixth-grade science, fifth-grade natural science, and "Parlons Français," a French language course for students in the fourth grade.

Every effort is being made to extend this network through the establishment of educational television facilities in adjacent states. However, it has been a slow process due to lack of funds and, in some cases, lack of suitable VHF frequencies. In the meantime, some progress is being made in various states through the use of commercial television stations. This fall the state Department of Education in Maine again will telecast programs to the schools over commercial facilities. They will offer two courses: "Science for the Space Age" over a state-wide network consisting of Channel 6 in Portland, Channel 2 in Bangor, and Channel 8 in Presque Isle; and "Concepts of Mathematics" over Channel 13 in Portland, Channel 5 in Bangor, and Channel 8 in Presque Isle. WENH-TV will pick up these two courses off-the-air from Maine, and rebroadcast them to New Hampshire schools. It is hoped that at a later date, WGBH-TV will carry the New Hampshire signal so that even more New England schools may be served.

New York State has established over the past year a very extensive program of in-school telecasting on a commercial station in New York, and by means of kinescope has been able to network some of these materials to commercial stations in Albany, Watertown-Carthage, Buffalo, and Rochester, as well as in Erie, Pennsylvania. In-school programs of the Mohawk-Hudson Council of the Troy-Albany-Schenectady area, have been repeated over a commercial station in Plattsburg, New York.

This combination of commercial and educational television facilities would seem to provide a useful interim method of regional networking. It does not appear to be a practical long-term solution, however, due to the increasing scarcity of good time on commercial television stations.

The development of state and regional educational television networking in New England is now dependent upon finding the necessary interest, funds, and frequency allocations to establish powerful and effective new noncommercial educational television stations. Toward this end, WGBH-TV has received a grant from the Fund for the Advancement of Education to:

1. Identify in each state of the region the groups and individuals who would actively advance the cause of educational television.
2. Provide information and consultation service on station construction, operation, utilization of the network, and such other matters as might be requested.
3. Stimulate action by educators and various community leaders in the region that would lead directly to the construction and operation of stations.
4. Coordinate all planning for the future development of both the network and individual stations in the region.

If educational television is ever to have a national live network, it would seem that this would become a reality only through the growth of regional networks and their eventual interconnection, thereby completing a national system of educational television—a network essentially self-sustaining, sharing the best of its various member stations with immediate impact and at the same time providing sufficient freedom to meet regional as well as local needs.

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Session VI

STATUS REPORT

Regional Overview—The South

Mr. William Bowden

Regional Programs Associate
Southern Regional Education Board

EARLY DEVELOPMENTS

The history of educational television broadcasting in this nation spans a period of only seven years, 1952 to 1959. Educational television development in the South has paralleled and often preceded the development of the medium in other sections of the country.

The region's legislators, governors, citizen leaders, administrators of colleges and universities and of public school systems acted early in unison to develop effective uses of television as one means of meeting educational needs of the region's schools, colleges, and communities.

As early as 1952-53 nine southern states had passed legislation supporting the study and development of ETV. The Oklahoma and Alabama legislatures became the first in the nation to appropriate state moneys for building ETV facilities. In Texas, the University of Houston was the first ETV station in the nation to go on the air. In 1954-55 Alabama built and operated the first state-wide educational television network in the nation.

As a result of this early burst of regional energy in activating stations, the South was soon the scene of much of the ETV development in the nation. Until 1959, 40 to 50 per cent of all operating stations were located in this region. Even today, the South operates 17 of the nation's 44 stations. Happily, other states are planning and activating more and more ETV facilities so that regional differences in the number of facilities are diminishing.

THE SOUTHERN REGIONAL EDUCATION BOARD'S EARLY ROLE IN ETV

The southern states and the Southern Regional Education Board became mutually concerned with educational television development when the historic decision of June 3, 1952, was handed down by the Federal Communications Commission reserving 242 of the nation's television channels for noncommercial use. Of this number, 78 channels were located in the South.

During the immediate summer months of 1952, SREB secured the cooperation of the American Council on Education, the Joint Council on Educational Television, and the Fund for Adult Education to sponsor regional efforts encouraging concerted action of the southern states to plan, initiate, and sustain facilities for televised instruction wherever needed.

With this sponsorship, SREB organized the Southern Regional Project on Educational Television with Dr. Robert C. Anderson as director. The Project's first commission was to organize the Southern Regional Conference on Educational Television held in Atlanta, Georgia, in December, 1952.[1]

Representatives of state governments, administrators and faculty of higher institutions and public school systems, heads of professional agencies and lay leaders from fourteen states convened to consider the best and most economical means of using the television channels allocated to the South.

The Project revealed needs for film production centers for regional distribution, consultative services to local stations in planning and production, regional centers to train ETV station personnel, regional research in the use of educational television, and cooperative program production and exchange of programs for the region. Through the years these needs have been met increasingly by such national organizations as the Joint Council on Educational Television, the National Educational Television and Radio Center, and the National Association of Educational Broadcasters.

SREB has maintained primary interest in stimulating regional cooperation among the colleges and universities of the South to engage in interstate network explorations, ETV research, cooperative program productions for use by colleges for regular campus students and adults, and regional sharing or exchange of ETV college programs. Close relationships between the national organizations and SREB have produced marked progress in meeting educational television's needs.

REGIONAL STIMULATION OF ETV DEVELOPMENT

As the southern states moved rapidly during 1952-53 to preserve channel allocations and pass supporting legislation for ETV development, there was considerable need for SREB to continue its Project on a more permanent basis. A SREB Regional Commission on Educational Television was named and was chaired by Governor Johnston Murray of Oklahoma. The commission took as its province the five needs that had been advanced by the earlier Project conference.

The commission emphasized liaison with the national ETV organizations already geared to help with film and program production and station activation, and recommended securing a permanent project director for a period of two years to work with state and local ETV commissions in bringing facts and information to them to help get started.

Dr. Kenneth Christiansen became project director during September, 1953, to carry on this missionary work. These activities during 1953-54 and 1954-55 were made possible by an initial grant of $36,400 by the Fund for Adult Education to the American Council on Education on behalf of SREB.

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[1] Regional Cooperation in Educational Television, a report of the Southern Regional Project on Educational Television (Atlanta: Southern Regional Education Board, 1952).

In October, 1953, Dr. Christiansen began publication of a newsletter designed to gather and distribute news about ETV progress in the South on a month-to-month basis. Since then, this newsletter has received wide distribution in the South. It contains late news on ETV program production, stations, equipment, facilities, publicity, research, and operations.[2]

In 1954 SREB conducted a regional survey of program resources and production-programing competencies that existed in the South. The study showed types of programs produced, facilities used, and resources from which program talent was drawn. Also seventy commercial television stations were surveyed to determine the nature of their organization in terms of personnel jobs. University and college courses offering television training were surveyed and reported.

In the same year SREB convened an advisory group to help explore the possibilities of regional program planning and production. During the following year, in 1955, program and production personnel of stations, of production and film centers, met for a Regional Program Planning and Development Conference. Consideration of specific regional program projects for higher education began in 1956.

The Third Annual Legislative Work Conference of the SREB met in Houston, Texas, in 1954 where reports and workshops concerning ETV were conducted. This Legislative Work Conference adopted two resolutions, one relating to the need to preserve the educational television channel allocations, the other recommending the continuation and expansion of the SREB staff and service in ETV to the South.

With this mandate, SREB sought funds to continue its ETV Project for the year 1955-56, and secured an additional grant of $5,500 from the Fund for Adult Education through the American Council on Education. This grant enabled the Board to complete plans for a formal Memorandum of Agreement between the SREB and the universities, community ETV associations, and public school systems that were licensed to actively operate educational television stations. The purpose was to establish a formal program of regional cooperation in educational television in the South.

PROPOSAL FOR A SOUTHERN STATES' ETV NETWORK

In 1955, serious exploration of the possibility of a sixteen-state ETV network in the southern states was proposed by Dr. John E. Ivey, Jr., then SREB Director. The SREB Executive Committee approved staff study of this idea. Dr. John K. Folger and others of the SREB staff analyzed research reports on academic, financial, legal, and engineering aspects of ETV. Results were reported to the Board in 1956 and the Board authorized continuing study.

Negotiations were begun with A. Earl Cullum, Jr., Consulting Engineers of Dallas, Texas, a leading communications engineering firm, for more specific data and detailed plans on the engineering features and costs of the network.

At about this same time the FCC announced that it would hold hearings on needs for microwave facilities in the nation during 1957. This was of tremendous significance to the future of educational television. Microwave towers between cities and between college campuses were a far less expensive, wireless means of creating a network of stations than to link them together by cable. This engineering feature was important to the SREB plans for a southern states' network.

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[2] So There You Are, Southern Regional Education Board monthly newsletter report on ETV developments in the South (October, 1953—December, 1958). Changed to Educational Television Bulletin (February, 1959, to present).

Also involved in this matter of microwave facilities was the issue of whether a common carrier like the AT&T should have the sole right to build and lease microwave facilities to commercial and educational television networks, or whether an educational network in particular should have the right to make other arrangements on its own or with other power sources at cheaper rates.

SREB took the position that it had a responsibility to southern higher education to testify. The Cullum firm was asked to design on paper a network of microwave facilities linking 309 colleges and universities in sixteen states. The firm of Krieger and Jorgensen of Washington, D.C., communications attorneys, were requested to aid the SREB and the engineers in preparing testimony to be presented to the FCC.

In July, 1957, the SREB testimony was presented to the FCC by Dr. Robert C. Anderson, Director. In effect it argued the need for the reservation of microwave channels for interstate use by higher education. SREB did not request permission to build the network. It simply stated that educational institutions of the South should be granted a measure of choice in the matter, to use closed-circuit television if they wished, or open-circuit television using microwave facilities leased from the "common carrier" or from other sources if they wished. The testimony suggested what the network could be expected to do, and how it might be organized and operated. The testimony commented on capital and instructional costs, and its focus on educational needs in the South.[3]

On August 6, 1959, the FCC issued its decisions concerning the 1957 testimony. Educational television appeared to be favored with two large and basic policy determinations.

In the first place, ETV interests won the right to purchase or utilize power and transmission facilities from any source desired. In other words, it appears that ETV interests will be able to purchase power and the use of transmission facilities from a private source at presumably lower rates, if so desired, rather than being required to purchase such services from a "common carrier," such as the American Telephone and Telegraph Company, at presumably higher rates.

In the second place, ETV interests won the principle of reserved use of microwave facilities for interstate telecasting. However, this latter item appears not to be a victory in practical application. The frequencies that have been reserved for educational television are generally over 12,000 megacycles. SREB's engineering consultants have indicated that frequencies below 10,000 megacycles will be needed in order to bring the operation of a microwave network within technical and financial feasibility. The high frequencies assigned will make long-distance transmission very difficult and much more expensive than would be the case in the use of lower frequencies.

On September 8, 1959, SREB joined with the Joint Council on Educational Television in filing an appeal for reconsideration before the FCC asking that the decision on reserving microwave frequencies be amended in favor of the lower frequencies.

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[3] Robert C. Anderson, "A Regional Educational Television Network for University Teaching," College and University, Vol. XXXIII, No. 3 (Spring, 1958).

PROPOSAL FOR A THREE-STATE ETV NETWORK EXPERIMENT IN THE SOUTH

In late 1957, following the filing of SREB's testimony before the FCC, the SREB felt that practical experience in building and operating an educational network was needed. Plans were set in motion in October, 1957, to survey the possibility of a three-state pilot project in educational television involving seven institutions.[1] The three states and their respective institutions were:

Georgia	University of Georgia Georgia Institute of Technology Emory University
Alabama	University of Alabama Alabama Polytechnic Institute
Florida	University of Florida Florida State University

This area was chosen because of its geographical unity and because most of these states and institutions had either a state-wide network in operation (as in Alabama), or the makings of one (as in Florida), or an institution had facilities that could be linked up in the near future (as the case of the University of Georgia). This meant that a relatively small number of microwave facilities would be needed to hook up the facilities already operating separately in these three states.

Dr. O. C. Aderhold, president of the University of Georgia, was appointed chairman of the SREB ETV Pilot Project Study. The Project committee was composed of the seven institutional presidents involved. Dr. Aderhold appointed three subcommittees, one representing the ETV engineering staffs, one representing the faculty interests of the institutions involved, and one representing the ETV program production personnel in these institutions.

SREB retained Dr. Doak Campbell, president emeritus of Florida State University, to visit the presidents of these institutions during 1958 in order to hold extended discussions about the decisions that had to be made about participating in the interstate project. Dr. Alvin Biscoe, dean of faculties, University of Georgia, was retained by SREB to visit the campuses of these institutions during 1958 to discuss academic problems implicit in the network project with faculty leaders and staff. During this time the subcommittees completed initial studies of the pilot network possibilities from their points of view.

By September, 1958, the results of these investigations were rather clearly drawn. The engineering people were agreed that the operation of the three-state network was technically feasible. The programing people were agreed that it was possible to solve scheduling complexities and program production needs of the seven institutions.

On the other hand, it was equally clear that the committee of presidents and the several faculties felt that each campus needed more direct experience over a period of several years of using individual station facilities on individual campuses, and to learn how to cooperate by using network facilities within its own state lines.

The presidents were interested in having more information concerning the costs of an educational network and the justification of those costs. Both the presidents and faculties were interested in additional research into the comparative costs and comparative instructional effectiveness of mechanical alternatives to the network, such as the use of instructional films or videotapes on an exchange basis between campuses.

Further, it was felt that separate, trained ETV faculty would be needed to handle televised instruction. All of the present faculties would be needed to handle the increasing load of classroom instruction, the presidents said.

In general, the committee of presidents felt that their institutions were not sufficiently experienced or financially able to undertake educational experimentation via interstate microwave facilities.

FORCES AFFECTING PLANS FOR INTERSTATE EDUCATIONAL TELEVISION IN THE SOUTH

There are at least five forces that are affecting continuing plans in the southern region for interstate cooperation in the use of television for educational purposes.

First, there is the familiar, inexorable pressure of mounting student enrollments in the region's colleges and universities. These large enrollments are already with us. Many more are coming. These large enrollments will require educational innovations to cope with the demand for increased educational services. If several state or regional ETV networks are to be of real service in time, then they must be brought into being soon or other educational innovations must be found.

Related to this first force is a second familiar force, the pressure of lack of large funds for initial capital outlays for building network facilities, either within state lines or between states.

Federal legislation to provide the states with capital moneys for in-state development of ETV networks has been pending for over two years now. The rapid development of each state's educational television facilities depends very much upon the availability of this financial assistance. Unless this assistance is forthcoming soon, educational television will not be able to play a large role in meeting the instructional needs of the nation in a time of need.

The third important force, a very positive one, is the comparatively recent technological development of the videotape recorder. I want to talk about this electronic marvel in a moment.

Closely related to this is a fourth force—the widespread and almost simultaneous availability of videotape recorders to most of the nation's ETV stations. This was made possible by the recent Ford Foundation grant to the National Educational Television and Radio Center. For this reason, the potential of state and regional "videotape recorder program production and exchange networks" has become a major item to consider in ETV planning.

A fifth force for change is the fact that the Southern Regional Education Board, an interstate agency organized to work with higher education in the South, must increasingly utilize its resources to help colleges and universities develop their uses of educational television. In prior years SREB has spread its limited resources to champion ETV development in the South for a variety of educational agencies. Now, SREB must attend more closely to higher education's needs and concerns in ETV.

I would like to consider each of these forces briefly, especially in terms of what they suggest in the way of revised thinking about the feasibility of new directions of state and interstate ETV networks in the South.

Force 1. Increased College Enrollments and the Need for ETV

The Southern Regional Education Board is one of many agencies which have been searching for solutions to meet the emerging problem of caring for the educational needs of increasing numbers of students flocking to our colleges and universities. Short of a third World War it now appears inevitable that the rapid increase in student population in institutions of higher education during the next several decades will pose even larger problems than have been experienced by the nation's public schools since 1950.

In the southern region of the United States we know generally that most of our states will be dealing with almost double the number of college students in 1970 that they had in 1955, and in the case of Florida the college student population is expected to triple by 1970.[4]

In an article published in the spring of 1958, the director of the Southern Regional Education Board, Dr. Robert C. Anderson, summed up two choices for action left open to colleges and universities to meet this crisis.

"Higher education, then, faces two alternatives: raising the barriers at the admissions office, or accepting new ideas about the teaching and learning process. Most of us, with our American heritage of education for all who can benefit from it, look with horror upon those who would close the college doors to the great unwashed. However unhappily, we turn to the other alternative and begin to consider educational innovations.

"One such innovation is television."[5]

State, regional, and national cooperation in the use of microwave networks, and similar cooperation in the uses of videotape recorders for production and exchange of programs and telecourses, may be of large help in accelerating the practical application of television to the educational needs of our nation's colleges and schools. If microwave networks are too expensive and complicated to be established in the next two to four years, efforts should be made soon and quickly to organize videotape networks for cooperative production and exchange of programs. Higher education cannot wait indefinitely for television networks to develop.

Force 2. The Need of Federal Assistance in Developing ETV

The need is large for initial federal financial assistance to the states for capital developments of ETV facilities. Such assistance would do two worthwhile things. First, the opportunity to obtain federal ETV funds should cause each state to formulate realistic, inclusive plans for optimum ETV facilities that could serve as many people and as many educational institutions in the state as possible. Second, the substantial federal assistance, either by outright appropriations, or by matching federal-state appropriations, would permit rapid development of facilities in time to be of large, continuous usefulness, and would permit states to develop plans concurrently using equipment and transmission patterns sufficiently compatible for possible interconnecting across state lines in later years.

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[4] John K. Folger, A Factbook on Higher Education in the South (Atlanta: Southern Regional Education Board, 1956).

[5] Robert C. Anderson, op. cit., p. 304.

One of the largest contributions that the members of the National Association of Educational Broadcasters could make at this particular meeting, at this particular time, would be to go on record vigorously supporting and urging the rapid passage of the Magnuson Bill—and all compatible compassion legislation—early in the next session of Congress. We need to say loudly and clearly, unless this federal financial assistance is forthcoming soon, the educational institutions of our states will have to abandon plans for extensive use of educational television to help meet their pressing need for new ways of providing large-scale instruction for our nation's public school and college youth.

Force 3. Impact of the Videotape Recorder on Network Plans

While SREB and leaders in education and television were devoting many hours of study and debate during 1957-58 to the possible usefulness of a sixteen-state microwave network and to the attempt to organize the three-state network experiment, a large force for change was beginning to be felt by the people and the agencies concerned. This was the emerging electronic marvel of the videotape recorder.

Generally unknown before April, 1956, the videotape recorder has since been rolled out of the secrecy of the laboratory and has advanced rapidly through a series of experimental stages. Truly here is a most useful tool for both the telecaster and the educator, a machine that will record both picture and sound, that will replay immediately both picture and sound with the quality of a live performance, that will permit erasure of the used picture and sound, and that will then take new sound and picture recordings placed on the same tape over and over as desired.[6]

Faced with the prospect of a long delay of years before leaders in educational circles and state governments could be won to supporting the large microwave network costs in money, manpower and adjustment, SREB has begun to consider the practical uses of the videotape recorder in the operation of individual ETV stations and state ETV networks. The implications for using videotape recorders as a basis for forming an interstate "network" system to cooperatively *produce* and *exchange* videotaped programs have seemed increasingly promising and practical to SREB and to educational institutions of the South.

— A videotape production and exchange network system among the higher institutions of the South *vis a vis* a microwave network probably would reduce problems of financing, operation, and instructions to a considerable degree.

— Once equipped with an adequate number of recorders and tapes, a videotape network would require no additional capital investment in expensive equipment and structures at or between existing and future stations, nor sizeable increases in annual operating costs, nor sizeable increases in technical staff. I do understand the videotape recorder will require a trained engineer to spend most of his time maintaining the machine before and after its operation, as well as during its operation. I also understand that the cost of an adequate supply of videotapes is a sizeable item. A basic number of tapes needs to be on hand for normal operations. Another supply needs to be on hand to serve as spares. Still others will have to be tied up in storage containing highly valuable program material. (However, I understand that in this instance the kinescope can continue to play a large role as the means of storing valuable material taken off tapes.) If exchange of tapes is worked out, still more tapes will be tied up in transit and in long-distance use. It seems likely that annual operating costs of individual stations may increase somewhat because of the use of videotape recorders.

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[6] Robert A. Miner, "The Videotape Recorder," *NAEB Journal* (May, 1958), p. 24.

Yet are these costs high at all when one considers, on the one hand, the probable much larger expense in equipment and manpower in operating a microwave network between institutions, localities, or even states; and, on the other hand, the large educational service that could be rendered to our institutions by independent ETV stations operating to serve their individual locality's needs and schedules, while at the same time cooperating in the production and sharing of videotaped programs and courses? Would not a relatively simple program production and exchange videotape "network" be far more feasible...more flexible...more adaptable...more economical...more useful...than a microwave network requiring complicated coordination of schedules, services, academic content, utilization of faculties, use of physical space between multiple institutions? Would costs for a videotape network be much more than the salaries for an additional engineer per station and the costs for extra supplies of tapes? In contrast, estimates indicate that the proposed sixteen-state microwave network between 309 institutions would cost seven million dollars annually to operate, and possibly fifteen and a half million per year for course planning, teaching, production, and local campus distribution costs.

— Each ETV station, institution, and state network could participate in a tape production and exchange "network" to any degree desired. No painful adjustments would have to be made by a group of stations and institutions with wide variations of readiness, experience, financial capabilities, and instructional needs to "gear up" for participation in a complex, simultaneous microwave network schedule.

— An interstate production and exchange system of videotaped courses and programs would allow each institution to schedule use of the tapes according to its own convenience. No longer would there be the monstrous specter of trying to schedule microwave network program telecasts between institutions in the eastern time zone and those in the central time zone, between institutions on a quarterly schedule and those on a semester schedule.

— The possible flexible uses of videotaped courses may eliminate most of the difficult problems associated with devising microwave network television courses for synchronized use by diverse institutions using diverse curricula. For example, no longer is it necessary to wrestle with the design of a single college freshman mathematics course to be telecast via a microwave network and adapted to student needs in such diverse institutions as small liberal arts colleges, large university colleges, engineering schools, teacher training schools, junior colleges and collegiate vocational schools. No longer is it necessary to try to devise a network telecast on freshman mathematics to colleges that organize their course as mathematical analysis and to other colleges that organize their course along the conventional pattern of algebra, trigonometry, and analytical geometry. Because of the limitations of numbers of hours in each day and the limitations of the number of circuits on a microwave network, it has been necessary to think of designing single, highly adaptable telecourses. A videotape network will have no such time or circuit limitations. Several telecourses dealing with the same subject matter can be produced to fit institutional and curriculum variations.

— Videotaped sequences of teaching materials will allow each institution and station to use ETV as much or as little in a specific course as desired. No longer is it necessary to consider complex faculty agreements associated with microwave network schedules over what percentage of a given college course subject matter should be telecast and what amount should be taught live by individual classroom teachers.

Each institution can prepare videotaped material for ETV production to any degree and sequence desired. However, there does still remain the very large legal matter of whether an institution has the right to modify the presentation of a course prepared and owned by another institution. (There is the related legal matter whether faculty who write TV courses are entitled to royalties in the same manner as faculty who write published books. Likewise, should faculty authors of TV courses get royalties every time for courses performed as do authors of plays that are performed?)

— A videotape "network" system should provide so much more flexibility for individual institutional faculties to tailor their use of the ETV instructional tool as best fits their needs, that many of the "targets" for criticism that faculty find inherent in a complex microwave network plan should be eliminated. Videotapes should tend to win faculty support for ETV.

For these reasons, SREB is giving serious consideration to experimenting with regional program production and interstate "network" operations by means of tape exchange arrangements as a possible alternative to a regional microwave network. SREB has no firm conviction about the long-range educational and operational effectiveness of either mechanical alternative for interstate needs. Certainly microwave installations have proven their worth in several situations.

The electronic and technical advances of the medium are still in infant stages. A microwave network or even a videotape network may seem like antiquated ideas five years from now by some new laboratory-bred electronic apparatus. However, at this stage of history, at least in the southern states, it does not appear feasible from the standpoint of financing, of human acceptability, of the passing of time, to do serious planning for an interstate microwave network. It does appear that an interstate videotape production and exchange network may hold large promise, for these reasons:

— College and public school telecourses could be produced to provide a library of instruction for individual institutions, for a system of related institutions, a state or regional aggregate of institutions. Here the implications are obvious for regional and national cooperation in the production and exchange of videotaped programs and courses.

— Instruction by the nation's top educators and purveyors of knowledge can be recorded on videotape at conveniently arranged times. The pressures, snafus, and perishability of live performances would be eliminated. Videotapes would permit courses to be produced, paced, edited, rehearsed, evaluated, and revised prior to use. Once in use, individual faculties can apply and pace the taped telecasts as desired.

— Videotaped courses can be adapted to the needs of several kinds of students in the different schools and divisions of a university, and also used for adult students in university extensions or evening colleges.

— One of the largest economies implied in a videotape production and exchange network is the fact that programs and courses of live performance quality can be stored for re-use year after year. The erasure and re-use features of videotapes allow courses to be updated, edited, and revised in the light of new events, experiences, and discoveries. The advantages of these features in keeping telecourses in atomic physics or international relations up to date are obvious. Laboratory experiments, special events of educational value, phenomena in action may be captured on videotapes under the best possible predetermined conditions.

— The videotape recorder represents many possible uses for teacher training and evaluation programs. Teachers may practice their art and observe their methods and use of content by immediate play-back of a videotape recording. Experiments in teaching methods can be recorded and observed. Classroom and ETV teachers can plan their courses, rehearse them via videotapes, and observe the results before final results are videotaped.

SREB feels that there is so much undetermined potential in this new electronic marvel that extensive consideration should be made of possible state, regional, and national cooperation in the use of videotape recorders for production and exchange of programs and courses, in addition to further consideration of the uses of microwave facilities for specific institutional situations.

Force 4. The Impact of the Videotape Recorder Grant to ETV Stations

The fourth large force for change was the grant of $2,706,000 from the Ford Foundation to the National Educational Television and Radio Center on June 25, 1959, to equip NETRC-affiliated ETV stations with videotape recorders. The effect of this grant is that almost every ETV station in the South—and in the nation as well—will receive similar technical equipment within a matter of months. The majority of the stations in the South and the rest of the country can plan in immediate and realistic terms possible means of cooperation in some form of a videotape network system.

Force 5. The Changing Role of SREB to Educational Television in the South

Another force for change is SREB's relationship to educational television development.

SREB is a public agency created and supported by the sixteen states of the South. The Board's specific educational and legal mandate is to concern itself with the needs and problems associated with training and research in institutions of higher learning—in colleges and universities—wherein such needs and problems may be best approached and solved by cooperative interstate and institutional endeavor.

Since 1956 there has existed a formal Memorandum of Agreement for the Development of Educational Television in the South between SREB and nineteen agencies in nine southern states. These agencies consist of eleven higher institutions, four public school systems, three state ETV authorities, and one private community ETV foundation. Some of these agencies have been very active in developing educational television. Some have not been active. One of these agencies no longer exists. Because of this situation, SREB has recommended to its Board withdrawal from the Memorandum of Agreement by October 13, 1959, for these reasons:

1. SREB's primary assignment is in the area of higher education. The present Memorandum of Agreement includes public school and community agencies. SREB intentionally departed from its customary policy when it entered into an agreement which involved some agencies other than colleges and universities in order to assist the start and the development of educational television in the South. Now, however, SREB should concentrate, in the future, on higher education's role in educational television. This is not to say that SREB by such action would be expressing a loss of interest in other agency efforts in educational television, but rather that its future program emphasis will be on the contributions which higher institutions can make to the total educational television effort.

2. Some agencies and institutions party to the agreement were invited to become signatories on the basis of projected plans in educational television which have not developed. Thus a number of signatories have made little contribution to the effort, while new agencies, not in existence at the time the agreement was signed, have come into being without becoming party to the agreement.

3. It is SREB's opinion that this agreement has served its principal purpose, and that the needs of the region in educational television can now best be served by another mechanism for cooperation than that of this agreement. It is the policy of the Board to enter into such agreements when there is institutional interest and regional need, and to offer such assistance, financial and otherwise, as it can to furthering the terms of the agreement. It is also the policy of the Board, however, to withdraw from such agreements at such time as their purposes seem to have been met, or when it becomes obvious that the agreement has outlived its value, or when it appears that the other parties can accomplish its purposes without further participation by the Board.

SREB will seek authorization from its Board to replace the present Memorandum of Agreement and its Regional Committee with the appointment of a small advisory council in educational television to guide the director and the Board on activity in this field in the future. Members of this council will not be appointed to represent institutions or ETV stations, but rather because of high individual competency in the field and familiarity with broad categories of educational television.

Such a council will advise on needs for specific SREB activities, and suggest procedures for meeting those needs. These procedures might include the appointment of committees to undertake specific tasks, conferences for specified purposes, or even new memoranda of agreements among selected institutions to accomplish significant projects within specified periods of time.

The regional advisory council will be composed of about ten persons of recognized competence. Such a council will be able to function more efficiently as a representative body of broad areas of ETV interests in the South, in contrast to an oversized regional committee functioning as a parliament and composed of members from every agency or institution in the South using ETV.

The regional advisory council will be an efficient means of developing regional interests of SREB, the higher institutions, and the ETV stations in the use of the medium for Southern higher education. The council will assist in identifying action projects of merit, and will assist in establishing ground rules for operations.

SUMMARY

Some of the large factors contributing to the South's desire to consider the potential values of a regional videotape production and exchange "network" system are: (a) widespread resistance to the difficult problems and high costs associated with an interstate microwave network, (b) rapidly mounting enrollments in higher institutions that must be provided with instruction by large-scale teaching innovations, not in a matter of years from now, but *now*, (c) the time lag in federal financial assistance to build ETV microwave facilities, (d) the rapid technological innovation of the videotape recorder, (e) the widespread availability of the videotape recorder to most ETV stations through the Ford Foundation grant to the NETRC, and (f) the sharpening focus of SREB on the educational television needs of colleges and universities in the South. If such an enterprise has merit, it would be SREB's hope that other regions would develop similar systems, all working in cooperation with the interested national ETV organizations.

Session VI

STATUS REPORT

Regional Overview—The West

Mr. Loren B. Stone

Manager
Station KCTS-TV, University of Washington

There is almost no true networking of educational television programs taking place in the Far West at the present time, nor are there many definite plans for developing network groupings in the near future. One reason for this is the relatively great distances involved in this part of the United States.

The principal dissemination of television programs beyond the originating educational television station or educational production center currently is by kinescopes occasionally made available to other educational stations, but more generally to commercial stations within the originating facility's own state.

There are at present two educational television stations in California—one at San Francisco and one at Sacramento; one each in Washington (at Seattle), Oregon (at Corvallis), Utah (at Salt Lake City), Arizona (at Tucson), Colorado (at Denver), and in New Mexico (at Albuquerque). There are no operating stations in either Idaho or Montana. One additional station is under construction at Lakewood Center, near Tacoma, Washington; and serious efforts are being made to activate stations at Portland, Oregon, and Fresno, California. One UHF "translator" station has been installed in Washington to rebroadcast the programs of Seattle's educational television station.

In California, Station KVIE, Sacramento, has leased one series of in-school programs from Station KQED, San Francisco, and plans to rebroadcast one series of in-school programs this fall, from an off-the-air pickup of KQED. Since it is not possible for San Francisco to make a direct pickup of the Sacramento signal, studies have been made to determine the feasibility of a microwave link between these stations. The two-hop link required calls for an expensive microwave installation, and funds are currently being sought to permit its installation. KQED, San Francisco, is presently installing a kinescope recording system and it is hoped that kinescopes or videotapes can be exchanged between the two stations on a regular basis until such time as a microwave link can be established. Interest appears to be developing in the Fresno, California, area, which may result in the activation of the reserved channel there. This would make possible a three-station Northern California network, with the stations providing each other program service through either microwave facilities, or kinescope, or videotape.

Oregon has developed a somewhat unique "Inter-institutional Teaching Project" involving the use of a single open-circuit transmitter by one private and three public institutions of higher learning in the western part of the state. The centrally located transmitter of KOAC-TV, of the Oregon State System of Higher Education, located at Corvallis, broadcasts instructional programs for college classes fed to it by microwave links from the University of Oregon, at Eugene; and from the Oregon State College studios at Corvallis, where programs are presented by both Oregon State College and by the Oregon College of Education at nearby Monmouth. The three courses broadcast during the 1958-59 school year in basic chemistry, history of the United States, and education, were viewed by students of the three originating institutions, as well as those of Willamette College in Salem, Oregon.

This year's Oregon legislature made an appropriation to assist the Division of General Extension of the State System of Higher Education in getting an additional VHF channel in Portland under way. It is expected that when the Portland station is in operation, the two transmitters will be linked together for some direct exchange of programs, either by off-the-air pickup or by microwave connection. An additional studio is being planned for Salem, the state's capital, which would be able to provide programs to either or both of the state's ETV transmitters.

In Washington, Seattle's educational television station, KCTS (TV), has for the past year provided five in-school instructional programs per week, via kinescope, to be broadcast by the Bellingham, Washington, schools on time contributed to them by their local commercial television outlet. Schools in Washington's Skagit County, approximately sixty miles north of Seattle, assessed themselves each sixty cents per student last year to finance erection of a UHF "translator" station to permit the rebroadcast of the Seattle station's in-school programs for the scattered rural schools of Skagit County, which were unable to get satisfactory direct reception of the Seattle programs due to mountainous terrain. This automatic, unattended transmitter will broadcast the originating station's full schedule of daytime and evening programs not only for the Skagit County schools but for those residents who wish to add UHF converters to their present VHF-only sets.

The Grays Harbor Cable System, operators of a community antenna system in Aberdeen and Hoquiam, Washington, another area of low signal for the Seattle ETV station, is distributing the KCTS (TV) programs over its cable system and has made a cost-free connection to each of the area's public schools and to Grays Harbor Junior College, so they may utilize the ETV instructional service in their classrooms. A separate channel on the cable distribution system is being reserved for the schools for local origination of audio-visual instructional materials.

In addition to kinescoping all its in-school programs (for multiple repeat during the week and for replay in succeeding years) KCTS (TV) has recorded many of its evening telecourses on kinescope film for re-use by commercial stations of the state. During the 1958-59 school year, more than two hundred program units were broadcast on Washington commercial stations from kinescopes prepared by KCTS (TV).

Washington State University, at Pullman, has installed a kinescope recording unit and proposes to commence distribution of educational television programs produced in its closed-circuit facilities to stations in the state during the 1960-61 school year. Little information is presently available as to the programing plans of KPEC-TV, the new ETV station being constructed by the Clover Park schools at Lakewood Center, Washington; but no plans have yet been made for "networking" by it, or of its programs.

Educational radio programs have been distributed widely, over the years, among stations in each of the states of the Far West. Almost every institution of higher education in the West has a broadcast station (either AM or FM) or has a closed-circuit radio production studio, and has provided radio programs to the commercial radio stations of its own state by audiotape for many years.

Probably of particular interest to educational broadcasters throughout the country—both those engaged in educational radio and those in educational television—is the uniquely successful plan of listener support developed by California's Pacifica Foundation for its nonprofit FM stations—KPFA and KPFB in Berkeley, and its new cultural contribution to Southern California, KPFK, Los Angeles. For more than ten years KPFA has continued to prove the postulation that a two per cent minority of a city's population could and would make annual contributions of at least ten dollars (now increased to twelve dollars) and thereby provide the total support of a "practical instrument of adult education and culture." While there is no true network exchange of programs between these two cultural FM stations in Berkeley and Los Angeles, California, there has been the "networking" of a challenging concept of the way in which a cultural facility can be sustained.

It seems likely that educational radio programs will continue to be "networked" throughout the Far West by school and college stations and closed-circuit production studios providing regular programs to commercial stations of their respective states on audiotape. There is no indication of great future growth in this area; on the other hand there are no signs that educational television is seriously disrupting the established pattern of educational radio broadcasting.

The cautious start which has been made in distributing educational television programs by kinescope from one station to another may turn to a steady flow as the videotape facilities being provided by the National Educational Television and Radio Center to its affiliated stations permits the exchange of tapes both among the ETV stations and with the ever-growing number of commercial stations which are becoming videotape equipped.

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Session VI

STATUS REPORT

Regional Overview—The Midwest: Television

Mr. Jack McBride

Vice President
National Association of Educational Broadcasters
Director
Television and Station KUON-TV
University of Nebraska

In scanning the Midwest and the remainder of the United States not covered in previous reports, there is ample additional evidence that local and regional educational television linkage is indeed feasible.

The following report will not concern itself with an itemization of "one-time" interconnections, though in the brief but significant years of educational television broadcasting, such cases of temporary microwaving or feeding by coaxial cable for special occasions have been numerous.

Nor will this report dwell upon the many examples of ETV stations, with the approval of local commercial outlets, tapping network broadcast lines to carry special network programs. This procedure has been quite prevalent during important special events such as a presidential inauguration and during the public-service-filled week ends when such network programing has been by-passed by the local commercial affiliate.

In this regard, it should also be pointed out that, through special arrangement with the National Broadcasting Company, the National Educational Television and Radio Center on several different occasions has been able to offer its ETV affiliates live series emanating from the New York and Washington studios of NBC-TV. Installation and line charges for a number of ETV stations carrying the programs live was assumed by the Center. Because of the impracticality of facilities or schedule, the remainder of the ETV stations carried the programs by delayed kinescope broadcast. The success of these ventures serves as another harbinger of future interconnection.

Nor will this report concern itself with the now long history of educational television extension of coverage through recordings. Since 1953, the National Educational Television and Radio Center has supplied its affiliated stations with a substantial package of network programs. Individual ETV stations and production centers across the country, especially those residing at state universities, have years of experience in bicycling locally produced kinescope recordings to commercial stations in their areas. With the advent of videotape recording, the Center will be able to expand and improve the network concept with its ETV affiliates.

Rather will the following be concerned with additional major examples of actual present local and regional educational television interconnection, their status and experience, as well as something of the planning for future networking which has entered the serious stage.

NORTH CAROLINA

Though the Midwest covers considerable territory, it would be stretching somewhat to lay claim to the State of North Carolina. Nonetheless, North Carolina presents a trenchant example of state interconnection.

Assigned to the Consolidated University of North Carolina, Station WUNC-TV began operation on January 8, 1955. Studios are located at the University of North Carolina at Chapel Hill, at North Carolina State College at Raleigh, and at Woman's College at Greensboro. The three studios are connected by microwave relay links to a 100-kilowatt maximum power Channel 4 transmitter centrally located at Chatham. Master control and film facilities are located at the transmitter. A mobile unit tours the state as another means of program origination.

Consolidated functions of transmitter, mobile unit, film, kinescope recorder, and traffic are carried out by a chief engineer and his staff, a film coordinator and editor, a traffic manager, and part-time bookkeeping help.

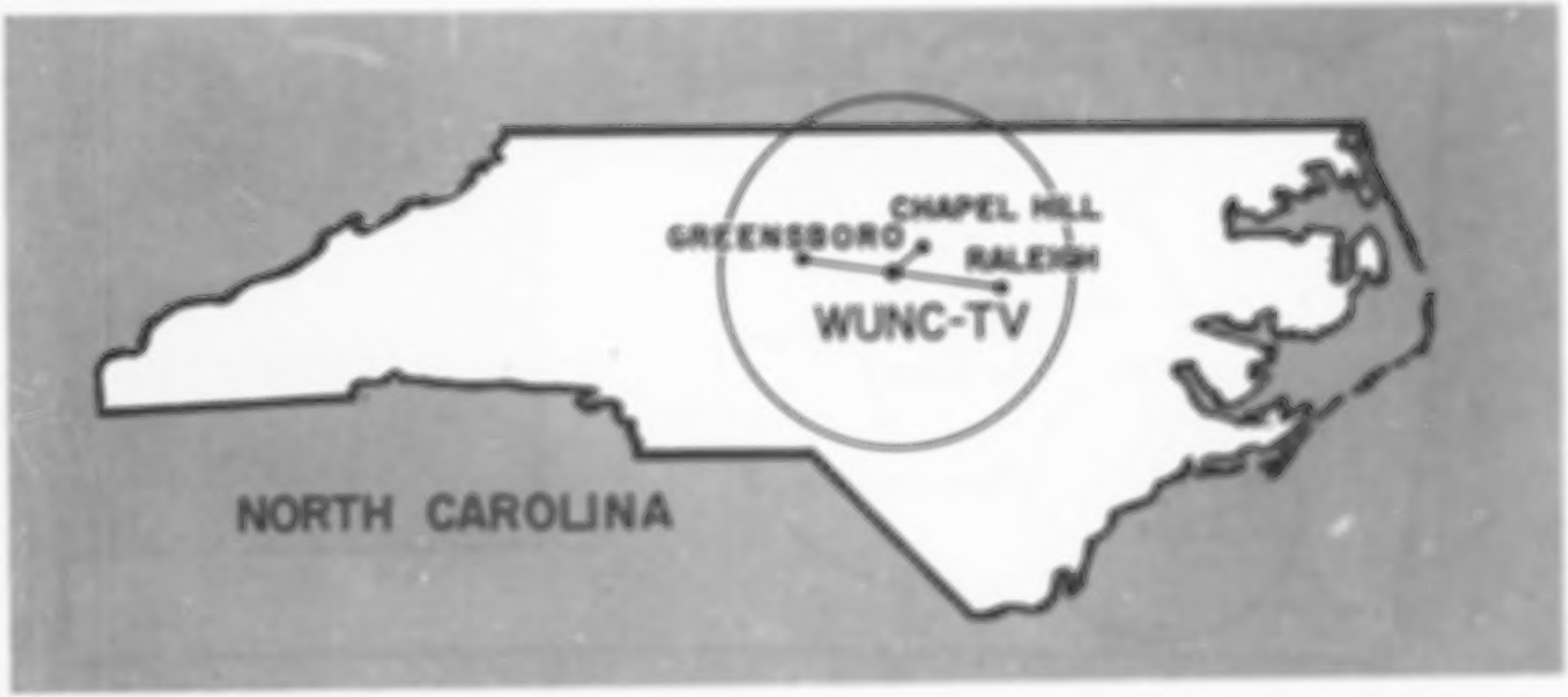
The three studio managers form a directorate to administer the station; in regular meetings they plan a consolidated program. Each manager and his studio crew is then responsible for his portion of the over-all program.

In addition to this linkage, WUNC-TV has for some time enlarged its coverage through feeding programing to commercial stations in the state.

Over the past two years, as many as seven commercial stations rebroadcast one or more of North Carolina's in-school programs, thus extending the range of the station considerably farther than the eighty-mile broadcast radius. In fact, the U.S. history and physical science courses may be seen the entire length of North Carolina and in parts of Virginia and South Carolina. Forty-three school systems with over 12,000 students are engaged directly in the television teaching project; and additional forty-eight systems and over 6,000 students are unofficial members.

WUNC-TV feeds live programing in other areas to the commercial stations as well. A farm network brings the combined teaching, research, and advisory personnel from agricultural education directly to thousands of farmers. Five commercial stations regularly rebroadcast the Sunday morning religious programs emanating from the Chatham transmitter, as well as special events fed from the WUNC-TV remote unit.

The WUNC-TV combined studio operating budget is $160,000 per year, plus an additional appropriation for the direct-teaching project. After four years of experience, the three studios alternately feed their common transmitter with over fifty hours of programing per week (73 per cent of it live)—an excellent example of coordinated linkage.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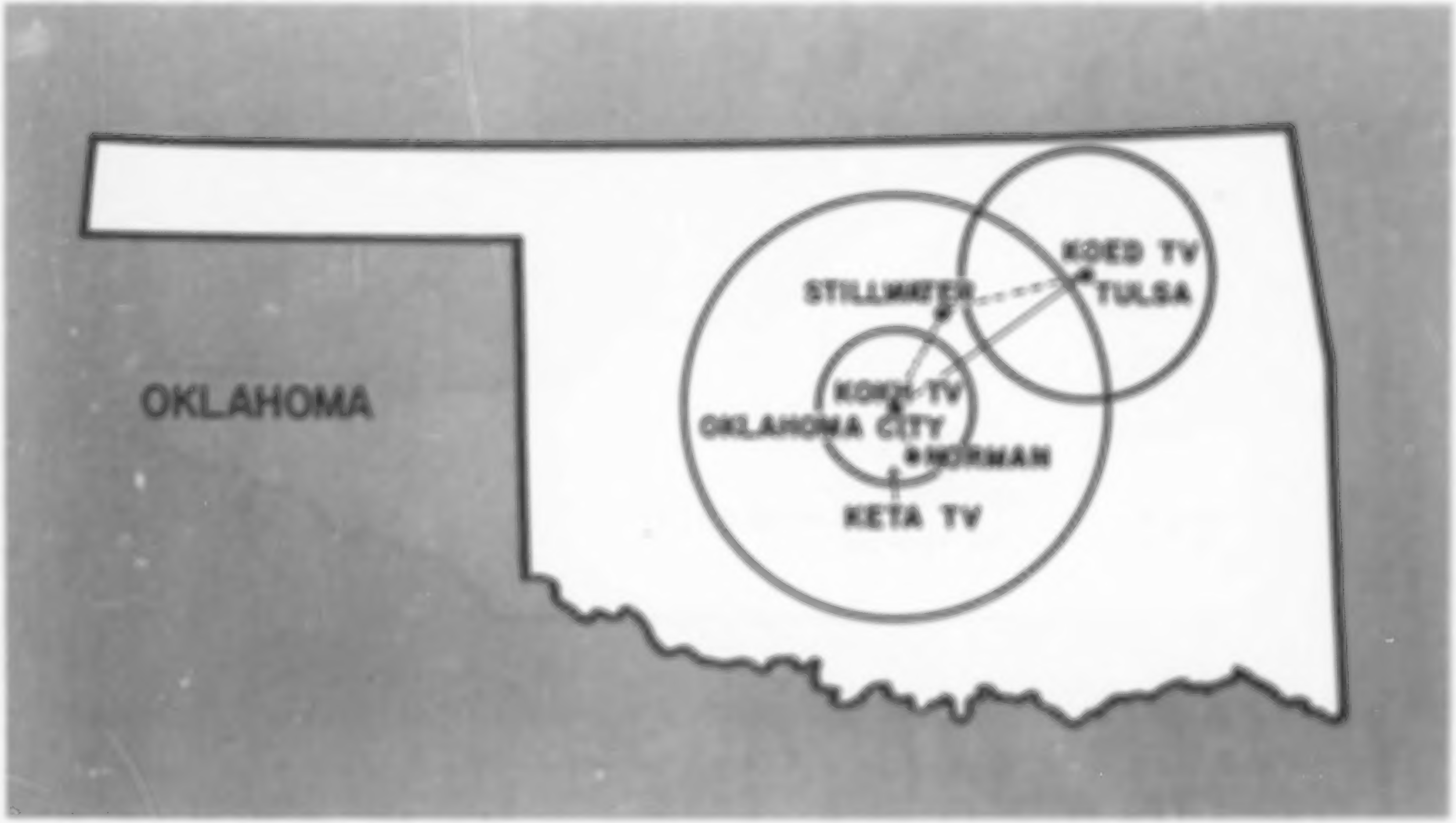
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PENNSYLVANIA

One of this country's most successful educational television station operations is located at Channel 13 in Pittsburgh. Station WQED, since April 1, 1954, has garnered many awards and honors and has provided NET with frequent outstanding programs. WQED in-school programs have been among the pathfinders. So successful has been the station, and so demanding the requests for program time, that the Metropolitan Pittsburgh Educational Television Station in 1958 petitioned the Federal Communications Commission for the assignment of unused UHF Channel 16. In history-making action, the FCC awarded a second channel in a duplicated area to a given educational licensee. This year UHF station WQEX joins its sister VHF station as a full-fledged broadcast facility.

On the eastern edge of the state, the Metropolitan Philadelphia Educational Radio and Television Corporation operates WHYY-TV, Channel 35. This nonprofit corporation has worked closely with the Philadelphia Board of Education in the presentation of successful in-school programs and has presented its share of outstanding adult informational and cultural series.

In the middle stands Pennsylvania State University, a pioneer among institutions of learning, employing closed-circuit television.

Through the auspices of the Office of State Superintendent of Public Instruction, a proposed state network is being discussed before various educational and legislative committees. Because of the leadership evinced in educational television in their state, it is logical to think in terms of concrete action in the not-too-distant future.

OKLAHOMA

Since April 13, 1956, the Oklahoma Educational Television Authority, a statutory corporation established by the Oklahoma State Legislature, has operated Station KETA-TV. By microwave relay, the Channel 13 transmitter is fed by studios at both the University of Oklahoma at Norman and the Oklahoma City Public Schools Broadcasting Center. From the Oklahoma City studio, programs are beamed directly in one hop; from the Norman studios, because a 1300-foot elevation intervenes, a mid-point relay is used. Though the KETA-TV transmitter operates with but a 10-kilowatt transmitter, because a supergain antenna sits atop a 1440-foot tower, Channel 13 programs cover a ninety-mile radius.

Thanks to a progressive ETV Authority and a forward-looking state, on January 12, 1959, the Authority also began programing Channel 11 in Tulsa. Station KOED picks up the KETA-TV signal directly and boosts it fifty miles in all directions. The antenna for this 2-kilowatt transmitter is located at the 900-foot level on a tower with a special receiver. The reception signal is thoroughly acceptable for rebroadcast purposes.

Because the Oklahoma City Public Schools have met with such success in employing televisitn for direct-teaching purposes, they recently activated UHF station KOKH-TV, Channel 25, at the site of their production center in Oklahoma City. This fall, 155 individual programs per week (105 of them live) will be fed either to KETA-TV/KOED-TV or to their own KOKH-TV.

The Oklahoma State Department of Education works closely with these in-school programs. This fall it is anticipated that seventy-five outstate high schools which do not have a local qualified teacher will be registering with the state Department for credit television work.

Future plans for the Oklahoma ETV Authority include a studio in Tulsa and a production center at Stillwater, at Oklahoma A. and M. Programs from KETA-TV will be picked up at Stillwater and microwaved into Tulsa; programs from Tulsa will be picked up at Stillwater and microwaved into Oklahoma City. Both KETA-TV and KOED-TV are to be raised to 25 kilowatts.

Under present power, the two stations cover about 60 per cent of the population of the state. By increasing power, the Authority will be able to achieve 75 per cent total state coverage. Current budget for the Authority is set at $200,000 per year.

KANSAS

For some years, educational interests in the State of Kansas have been promoting educational television. Particular leadership has been provided by Kansas State University, the University of Kansas, and the Kansas Congress of Parents and Teachers.

Concentrated action over a period of years has culminated in a plan presented this year to the Kansas State Legislature. Specifically, the plan called for the establishment of a State ETV Authority, a network of television transmitters established to provide a program service to every part of the State, and an annual operating appropriation.

Engineering and other studies provided the Legislature indicate that a first-class network, including eight transmitter units, seven production centers, and one portable production unit is possible at a cost of $4,950,000. A ten-year installment plan to outfit and program the network forty hours a week was recommended.

Late in this year's session, the Kansas Legislature appropriated $25,000 to the Legislative Council "for the purpose of making the benefits of educational television known to and promoting its use by the people of Kansas and of making an engineering survey to determine the proper minimum number and the location of transmitters necessary to provide adequate educational television coverage of the state."

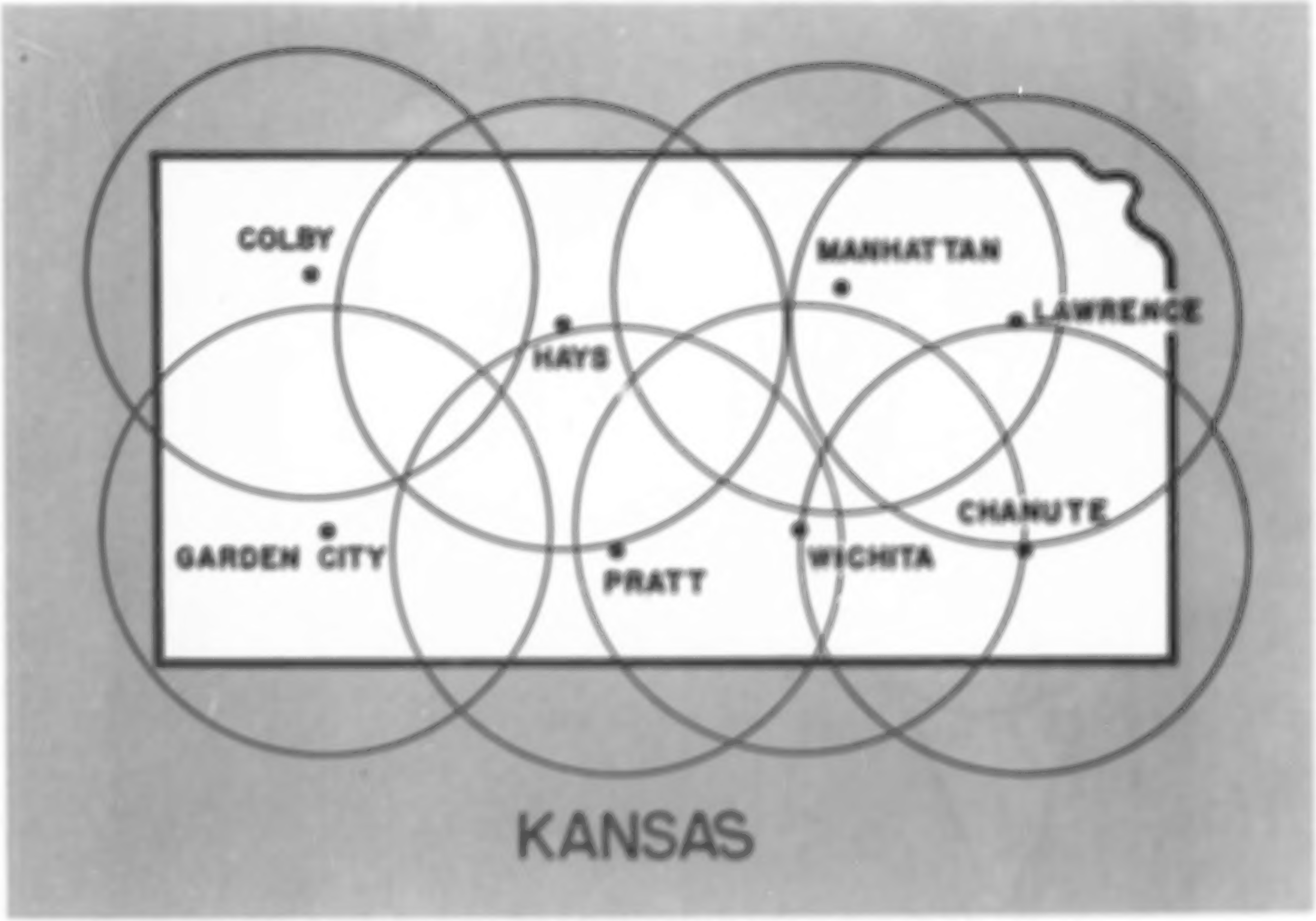
Meanwhile, the Kansas City School System, after experiencing success in using in-school television over local commercial stations, is moving towards activating its own channel. Applications have been on file for Channel 11 in Lawrence and Channel 8 in Manhattan; however, both universities are awaiting the outcome of this legislative study before taking further action.

MICHIGAN

From the very early days of educational television, the State of Michigan has been active. Michigan State University licensed the seventh ETV station on the air; it now co-holds the license to WMSB, with transmitter at Onondaga, Michigan.

With production studios at Wayne State University, the University of Detroit, and the Detroit Public Schools feeding a common transmitter, the Detroit Educational Television Foundation has programed Station WTVS since October 3, 1955.

The University of Michigan at Ann Arbor has maintained for years a first-class production center, originating kinescope recordings to feed both educational and commercial stations.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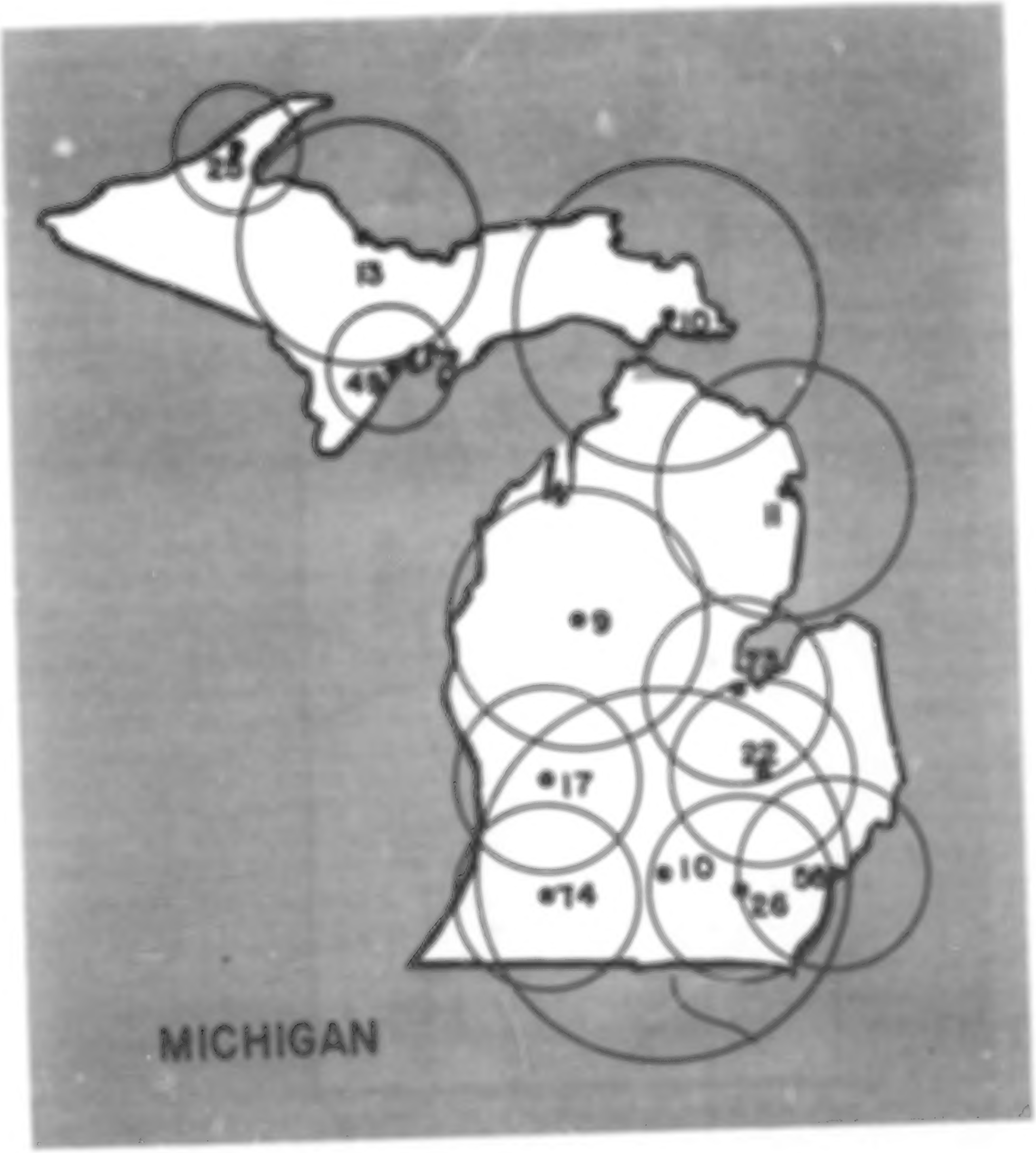
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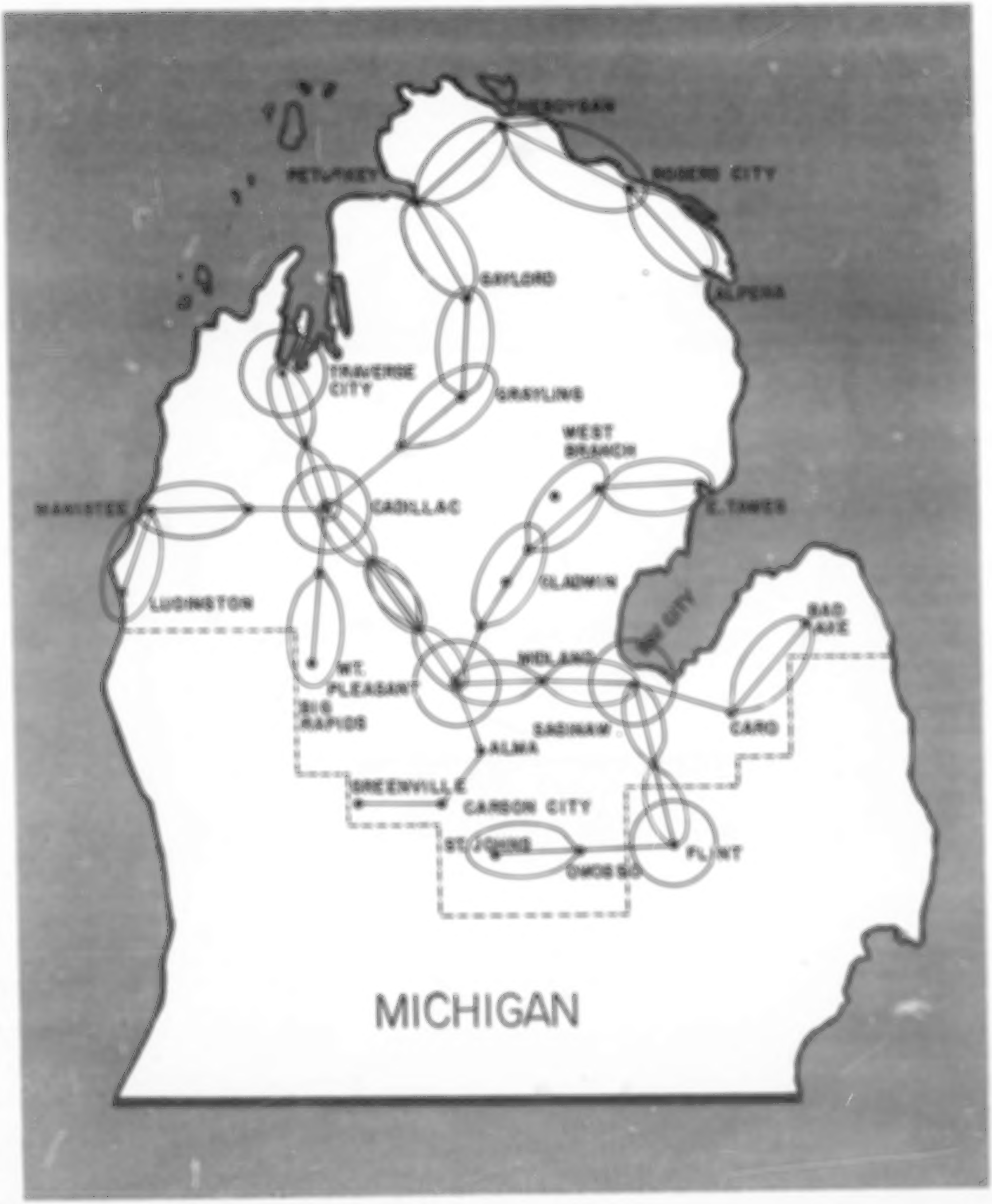
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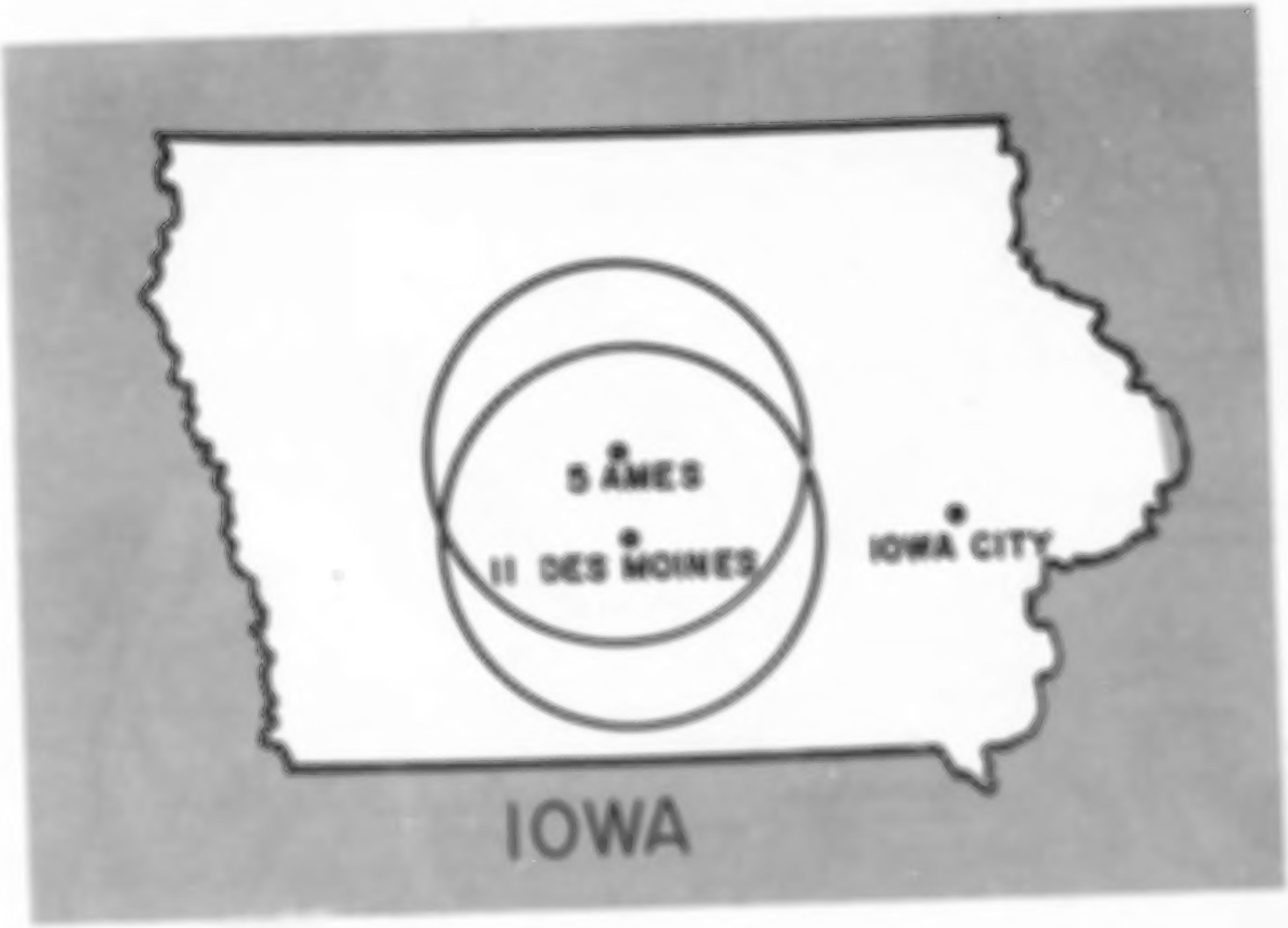

5 AMES
11 DES MOINES
IOWA CITY
IOWA

Central Michigan State University and other areas of the state are becoming increasingly interested in educational television.

As a result of the leadership provided by the above groups, the State Superintendent of Public Instruction has coordinated planning for an educational television state network proposal. Rule-making proceedings have been instituted before the Federal Communications Commission to amend certain allocations in favor of the projected ETV network. A Citizens Committee on Educational Television has been established; technical, equipment, budgetary, administrative, and other studies are currently under consideration by subcommittees.

One proposal under consideration would link the state with a series of activated channels; another would employ a series of translator systems.

IOWA

With a program activation date of February 21, 1950, Station WOI-TV, Ames, Iowa, was the first educationally owned television station to begin operation in these United States. Channel 5, which lists as assignee the Iowa State College of Agricultural and Mechanical Arts, (now Iowa State University of Science and Technology), still operates a successful commercial facility. Many phases of the ETV broadcasting complex had their origins here in the State of Iowa.

On December 16, 1952, the Iowa Joint Committee on Educational Television presented a report on plans for the future of ETV in Iowa at a special governor's conference. With the assistance of a Washington, D.C., engineering firm, technical studies were made. A detailed proposal showed twelve transmitters fed by four production studios interconnected by a system of microwave relays. Three stages of development were recommended. Public support was sought, but unfortunately, to date has not been forthcoming.

At present, WOI-TV continues operations. A production center flourishes at the State University of Iowa at Iowa City. A new ETV station, KDPS-TV, Channel 11, was activated this year by the Des Moines Public Schools.

INDIANA, SOUTH DAKOTA, ILLINOIS, MISSOURI

Since 1953, Indiana University at Bloomington has microwaved on a regular basis from its own campus production studios to a commercial station, WTTV, in Indianapolis. At present, eight programs per week are transmitted via this method.

For three years, Purdue University has also fed educational television programing to the same Indianapolis commercial outlet by means of microwave from its campus facility. Such activity and other interest has led the State Superintendent of Public Instruction to appoint a Committee on Television in the Public Schools, with James Miles, Director of Television and Radio at Purdue, as chairman—and state-wide planning is under way.

The State University of South Dakota at Vermillion is currently investigating arrangements with commercial Channel 5 in Mitchell, which will enable the university to microwave a proposed five hours of programing per week from campus studios. As the commercial outlet is already microwaving from Channel 4 in Sioux City, Iowa, and has plans to extend to cover Aberdeen and Sioux Falls, South Dakota, University of South Dakota television programs should soon offer coverage of the entire southeastern and northeastern portions of the state.

In Illinois there is talk of connecting Community ETV Station WTTW in Chicago with WILL-TV at the University of Illinois at Champaign-Urbana, with the proposed station at Southern Illinois University at Carbondale, and finally with Community Station KETC in St. Louis. Any plans for linking KETC with commercial Station KOMU-TV, operated by the University of Missouri at Columbia, would probably be deferred for the present in favor of a tape exchange.

NEBRASKA

Because of a highly successful University of Nebraska Extension Division high school correspondence study program, an overabundance of small-enrollment rural school districts, and an active University-operated ETV station, KUON-TV, extensive experimentation has been conducted during the past three years involving a combination of television teaching and correspondence study for the rural schools of Nebraska.

This past year, twenty-nine school systems participated in the project which carried state Department of Education sanction; this school year the large Lincoln school system participates for the first time. While no networking has been involved to date, this is the obvious solution to permit broader participation and to assist in solving a state-wide problem. However, in Nebraska as in each of the cases earlier reported, financing is a most serious consideration. Our interest in the Magnuson Bill therefore parallels that earlier expressed by Mr. Bowden.

BROADCASTING COUNCILS

Finally, another development has appeared on the educational horizon, a development which is predicted to see rapid growth in future years—the educational broadcasting council. In each case, a group of independent school corporations, each too small to bear the financial burden separately, combined resources to provide direct classroom instruction by television. In forming the Southwestern Indiana Educational Television Council, sixteen school corporations have arranged for the necessary legal clarification to permit a mutually supported broadcasting council with by-laws, a working organization, and daily television programs with supplementary materials for the benefit of all participating school enrollees. The Jefferson County, Kentucky, and Kentuckiana projects, and the Central Michigan Broadcasting Council are typical of other such projects. As this phenomenon grows in the American education, the need correspondingly grows for interconnection of broadcasting facilities in order to achieve greater coverage and provide educational service to more students.

This, then, summarizes activity, present and proposed, concerning educational television interconnection and networking in the Midwestern section of the United States, and some other areas not covered in the reports of earlier speakers.

Session VI

STATUS REPORT

Regional Overview--The Midwest: Radio

Mr. Lawrence Frymire

Manager
Stations WKAR-AM-FM
Michigan State University

Earlier in our sessions, Dr. Louis Lyons urged us not to forget radio.

It becomes more obvious each day that we have not yet learned how to use radio for its proper functions in education. And I think there is general agreement that radio has a place and function in our educational system.

So I preface my remarks with the thought that perhaps Edgar Dale is correct in saying that it takes our educational system some fifty years to adapt itself to significant new methodology. With Wisconsin's WHA now in its fortieth year of scheduled broadcasting and others, like Michigan State's WKAR, in their thirty-ninth years, we still have time to learn to use this valuable educational instrument and stay within the fifty-year time limit Edgar Dale suggests. And also let us remember that the term "network" as suggested by Ken Yourd this morning carries with it many images as well as possibilities of extending program services.

My subject is RADIO—educational radio as it is distributed in the United States from a "networking" or supplmentary use of radio programing beyond that provided by the originating station to other educational radio operations.

In the spring of 1959 a survey of some thirty-seven educational broadcasters throughout the country revealed the following information:

Alabama-------Nothing that resembles a radio network.

Arizona--------No educational radio stations on the air, merely two production centers—at Arizona State University, Tempe, and the University of Arizona, Flagstaff. No exchange of programs with other educational institutions.

California -----No formal arrangement for the sharing of educational materials among stations in the area. KPFA, Berkeley, "informally" exchanges programs via tape with several broadcasters in and beyond California. KPFK, Los Angeles, sister station to KPFA, will eventually be tied in to a mid-state relay station, which will permit actual "networking," perhaps within the next year. Local networks are feasible in California since both the number and proximity of transmitters could develop true network-type operations, given sufficient funds.

Colorado------ No coordinated activity exists in any of the institutions of the state.

Florida------- Discussion has taken place toward implementing interchange of programs. Nothing tangible to report as yet. Only occasional exchanges of programs between the University of Florida, Florida State University, and Miami Public School facilities.

Illinois-------- WILL, University of Illinois, has exchanged programs via tape with WBAA, Purdue University. Also WILL has rebroadcast the WBAA signal for baseball broadcasts.

The University Broadcasting Association, Chicago, has arranged for the cooperative production of ETV programs and has worked in the area of sharing time on commercial stations and in some cases has arranged for personnel in "Viewpoint," a radio series over a commercial station. Illinois Institute of Technology operates a production center which has distributed taped programs to midwestern university and college stations. The University of Chicago, exclusive of the NAEB Network, sends tapes of some of its programs all over the country. No formal arrangements have been established in the state to arrange for extensive sharing of programs either via tape or by live networking.

Indiana-------- WFIU, Indiana University, is the key station for all varsity football games and feeds this material to almost all of Indiana's commercial FM stations air-to-air. AM stations also pick up the nearest FM signals and extend the "network" to nearly every area of the state. "Indiana School of the Sky" taped radio series are used by twenty educational and commercial stations. The many school-owned low-power FM stations do not participate in any sharing of programing. WBAA, Purdue University, maintains a tape program service to all other school stations in the state. A newly developed FM station at Purdue will soon be available for live FM air-to-air programing relay within NAEB Region III.

Iowa---------- There has been no educational network as such in the state. In the past the State University of Iowa, Iowa State College, and Iowa State Teachers College have cooperated in the production of two weekly broadcasts in the general area of child development. This activity ended in 1953. WOI, Iowa State College, carries daily half-hour in-school programs originated and tape recorded at Iowa State Teachers College, as well as a weekly musical series. Drake University, Grinnell College, and Central College also supply regular taped series for WOI. Public school stations do not exchange programs but do serve local commercial stations.

Kansas-------- No programing exchange occurs other than that supplied by educational outlets for local commercial station rebroadcast on tape.

Kentucky------ No exchange between educational broadcasters, though WBKY, University of Kentucky, does serve commercial broadcasters with farm and home programs.

Michigan------ Along with the northeastern states, Michigan is now active in providing an educational network service to listeners. As long ago as 1949, Michigan State University and the University of Michigan radio facilities joined with those in Wisconsin in the experimental extension of programs via direct air-to-air FM relay. However, within the last year a program service on a regular basis has been established. While this is a limited effort at present, the activity has served to prove the possibility of "networking" and, from all indications, the activity will be enlarged in the near future.

There is now a weekly half-hour news-in-depth feature being carried by WKAR-FM, Michigan State University; WUOM, University of Michigan; WDET, Wayne State University; and WMCR, Western Michigan University. WKAR-AM also carries the program. FM air-to-air relay is employed, with all four stations originating a segment of the program each week. A convenient geographical pattern enables WDET and WMCR to monitor WUOM and WKAR-FM respectively. WUOM and WKAR-FM handle the switching arrangements by means of special FM receivers. For eight weeks this summer, WKAR-FM served as the originating station for three hour-long live concerts from the National Music Camp at Interlochen, Michigan. WUOM, WMCR, and WDET all carried all or part of the concerts, as their schedules permitted. The National Music Camp provides the line to WKAR-FM and there is the possibility that another year may bring extension of this Interlochen network by means of leased lines to other midwestern radio stations. This could develop into a combination FM relay and land-line network service to a five-state area. Details are being worked out.

WKAR, Michigan State University, and WUOM, University of Michigan, provide program series as well as special features to many midwestern university stations on a regular basis. This is by tape recording. Also these stations exchange some programs via tape with the other Michigan educational stations. Wayne State University, Western Michigan University, and the University of Detroit provide taped series upon request. An unusually large and comprehensive service is provided for the public schools of the state as well as the commercial broadcasters—again by tape recording.

Minnesota----- KUOM, University of Minnesota, has occasionally made its facilities available for both live and tape programing from Macalester College in St. Paul. Special affairs at the university are recorded and supplied to midwestern university and college stations.

Missouri-------No formal or regular exchange of programs exists in the state. Public school broadcasters do supply programs to commercial stations and for NAEB distribution nationally.

Nebraska------There is no exchange of program material in the state.

New Mexico--- No exchange of program material in the state. Taped series are provided for KANW, Albuquerque Public Schools, by several educational university stations. This is taped material for in-school use only.

New York----- Already reported on by Mr. Hartford Gunn, as part of his East Coast Network report. In addition, the Empire State FM School of the Air is a network of nineteen commercial stations using a daily thirty-minute in-school program. The proposed Educational FM Radio Network for the Northeast United States, as described by Mr. Gunn, represents a major breakthrough toward true "networking" among educational broadcasters in the region.

North Dakota-- No program exchange exists. KFJM, University of North Dakota, reports keen desire for the development of "networking" in the future.

Ohio --------- A separate report will be given on Ohio later in this meeting. WOSU, Ohio State University, and the FM station operated by the Toledo Public Schools are active participants in plans for possible NAEB Region III live FM relay. The extensive Ohio state university system operates several FM stations in addition to the one at Ohio State University.

Oklahoma----- No program exchange exists. There has been some tape exchange between the University of Oklahoma and Oklahoma State University. Possibility exists of two-way sharing of facilities between WNAD, University of Oklahoma, and KOKH-FM, Oklahoma City public schools.

South Dakota-- No program exchange exists. KUSD, State University of South Dakota, is the only educational radio operation in the state.

Tennessee---- No program exchange exists. WUOT, University of Tennessee offers service to commercial broadcasters.

Texas-------- University of Texas production unit has supplied several series of programs, via tape, to educational stations throughout the country. No program exchange exists between Texas educational broadcasters other than special series provided for the in-school stations within the state. Also taped series are supplied to schools for closed-circuit distribution as they may exist.

KUHF, University of Houston, has participated in an exchange of tape program materials with other state production centers.

Washington---- No program exchange exists other than taped programs provided on an occasional basis for exchange between the Portland Public School station, the University of Washington, and the State College of Washington.

Most of the preceding information has referred to regular or systematic program exchange. It is abundantly clear that there is very little program exchange among educational radio broadcasters. This should not be misinterpreted as lack of ability to produce high-quality programs or a lack of interest among educational radio operators to participate in such an exchange. The highly successful NAEB Tape Network has served to take over a major portion of exchangeable material.

Also, there seems to prevail across the country a policy of serving local commercial broadcasters. Again, this should not be misinterpreted as indicating a preference to serve our commercial brethren, but here again, the NAEB Tape Network service has been depended upon by individual educational broadcasters as the means of obtaining program materials from other educational broadcasters. Also, it should be pointed out that a great number of educational radio operations have come into being since World War II and especially within the last decade, but for a considerable number of years prior to the origination of these stations, the educational institutions of this country were servicing commercial broadcasters. This "habit" of serving local commercial broadcasters has given educational broadcasters a strong voice in many communities. It has also, I believe, been one reason why we have not shared our resources more among ourselves.

However, as educational radio gains a greater identity, its desire will grow to cooperate with other educational broadcasters. Increased program staffs, enlarged operations, ever more institutions operating broadcast outlets...these will result in producing a more significant body of program material and will make possible the joining together of many areas and regions of our country into "networks" of many kinds. Perhaps, with the proper promotion and development, a truly national educational radio network might come into being. As indicated earlier in this report and also by other speakers, various areas of the country are now being served, or soon will be served, by educational networks. It seems evident that these activities will become enlarged in the near future and gradually will spread their way across the nation.

A hopeful but modest beginning has occurred. There remain the physical and financial and legal problems of getting programs from one state to another. More equipment, more stations, more people in educational broadcasting, and certainly a significantly large sum of money, will be required to make educational live "networks" possible.

The northeastern United States and those states surrounding or close to the Great Lakes contain the heaviest concentration of both stations and personnel, as well as program and financial resources. I suggest that there is sufficient interest in these regions now to warrant immediate exploitation.

There are many advantages to a live network service to educational radio stations. Most obvious is the extension to other areas of the services of great teachers available in only some of the areas at present. First-class basic educational programs at both the in-school and adult levels could be brought to a mass audience at important moments in our social and economic life. Local production staffs could spend more time in developing quality programs for local as well as network use, if they were freed from maintaining large program time segments locally. Program services could be greatly enlarged if local stations could use network services. Such an expansion of program services could in the long run become possible at only a fraction of the cost of producing an equivalent number of programs in individual studios. Certainly the immediacy and universal characteristics of radio could be exploited to a greater degree, given network service.

Many persons and groups are actively interested in the development of "network" service in educational radio. Information gathered by the Engineering Committee and various regional committees, as well as the Research Committee of the NAEB, serves to point up the fact that "networking" is possible, desirable, and sought for by educational radio broadcasters throughout the United States.

Session VI

STATUS REPORT

A Regional Study

Dr. John Schwarzwalder

Director
Twin City Area Educational Television Corporation
University of Minnesota

I was grateful for Mr. Frymire's remarks quoting Dr. Edgar Dale that it takes fifty years to have a new innovation or tool accepted. Judging from the remarks of a couple of the speakers in the session immediately preceding this, I thought it would take at least a hundred or longer.

Due to the generosity of the Louis W. and Maude Hill Foundation, by gifts of upwards of $50,000, KTCA is going ahead with a survey to determine the practicability of a regional television network in the six states of South Dakota, North Dakota, Minnesota, Iowa, Wisconsin, and Nebraska. In that area there are now operating educational television stations at Milwaukee, Madison, Minneapolis, St. Paul, Lincoln, Des Moines, and WOI, which—though operated commercially, as someone has pointed out—is owned by an educational institution, Iowa State University.

These are now operating stations. There are VHF reservations. And may I point out, it is sort of tragic to look at the same thing taking place in Kansas planning that I have seen many times before, with eight different overlapping channels, all of which will use VHF.

The Midwest is a graveyard of such plans. There are such plans in Iowa and Minnesota—and here we have the same thing all over again.

We are going out to use only the V's which are reserved. The objectives of the study are to provide to the state governors, the state officers, the state legislatures, and educational administrators (including state and private college regents and trustees of each of these) a practical engineering plan for the establishment of the regional network, with a schedule of costs for each state's participation. Though we are still only in the middle of the study, such a plan has been devised and it is, of course, as we heard all along from others, feasible to do this particular job.

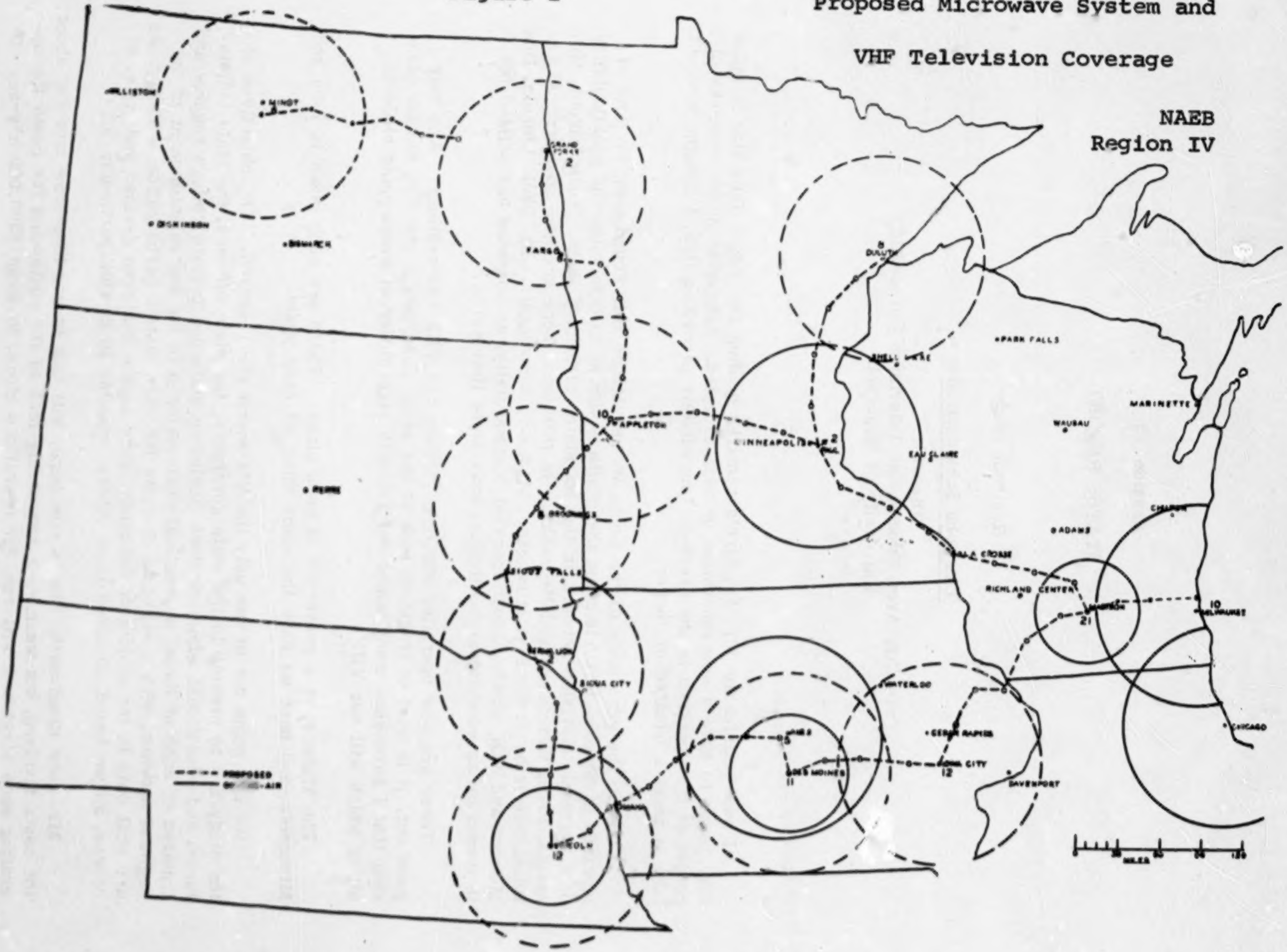
Mr. John Klindworth, who is now here, will talk to you tomorrow morning about the costs involved, but we have a reasonable idea of the costs—and the costs for operating such a network will run, for operations alone, to about $300,000 a year. If

Figure 1

Proposed Microwave System and

VHF Television Coverage

NAEB
Region IV


WILLISTON
MINOT
5
DICKINSON
BISMARCK
GRAND FORKS
2
FARGO
PIERRE
10
APPLETON
BROOKINGS
8
SIOUX FALLS
VERMILLION
SIOUX CITY
LINCOLN
12
OMAHA
DULUTH
8
SHELL LAKE
MINNEAPOLIS-ST. PAUL
2
EAU CLAIRE
PARK FALLS
WAUSAU
MARINETTE
ADAMS
LA CROSSE
RICHLAND CENTER
MADISON
21
CHILTON
10
MILWAUKEE
CHICAGO
AMES
5
DES MOINES
11
WATERLOO
CEDAR RAPIDS
IOWA CITY
12
DAVENPORT
PROPOSED
ON-THE-AIR
0
MILES

we take into consideration the depreciation, these costs will run close to half a million dollars. Divide this by six states, and you come down to considerably less than $100,000 per state. Divide it by, say, ten stations (and this is another thing that I will talk about later on) and you come down to a cost per station of $50,000 per year for the operation of such a network.

If you have twenty stations—and the network encourages the formation of stations—your costs come down proportionately, of course.

The second thing that we are trying to get is a listing of the program resources presently and potentially available to the network. You find the most astonishing results in this respect. You find far more in terms of program resources than you imagine when you start out. And you start out assuming that six states between them have a great deal to offer. You find out there is much, much more to offer than you dreamed of. You have to have the schedule of both costs and courses for the establishment of the network, and I was happy for what Mr. Bowden had to say. It costs money.

It will cost for this network in the neighborhood of 2 million dollars. This means Boggs-Magnuson or some other equivalents.

There is no sense in our boggling at this matter. It will cost money to establish programs. Mr. Bowden said it once, and I wanted to say it again.

Finally, we went out to find an administrative and policy plan for this network which would represent an informed consensus on these matters. As a by-product of this, we also have found that these facilities can be used and should be used for educational radio, as well as television, and that they will make the establishment of an educational radio network much, much less costly than might otherwise be the case, due to the fact that the towers and interconnections and the rest can be used for radio as well as for television.

When you look at a map, some of the problems that look too rough for any good use become suddenly less problematical. There is a double circuit going from Minneapolis-St. Paul all the way through South Dakota, down to Lincoln, Nebraska, across Iowa. Connected to it are Ames and Des Moines. Madison has a double connection both ways into Milwaukee. A leg goes off to Duluth, northward—and it looks to me as if the University of North Dakota might very well be interconnected on that radio network. It is a matter of 61 hops and 1,700 miles, and the engineers say it can be done on a two-way circuit that is included in this 2-million-dollar cost.

If one goes out, we can use the other one simultaneously—or you can broadcast on one and you can do closed circuit on the other.

This morning one of the speakers said, "What will you do about the scheduling problem? You can't do the same program at the same time in all the high schools in Des Moines, in Milwaukee, and in St. Paul."

Of course, you can't. This is not insoluble.

Another man said, "We have microwave interconnected networks being planned. Should we use those or do this by videotape?" Of course, the answer is that you do not have an either/or proposition. You have to use both, and if you use both, you send the program at a convenient hour. If it doesn't happen to be convenient in Des Moines, it is put on tape right at the station, and played when it is convenient for the Des Moines public schools.

By the same token, when Des Moines wants to originate something, it can put on its best program, and this may not be put on at a time convenient for the Grand Forks schools, but they, with a tape machine, will take it off to be used when it is convenient.

"All right," you say, "why not promptly make the tapes in the first place?" Here we come down to money. Tapes, the last I heard, were selling for $238 apiece and, while the miracle that made tapes possible in the first place may be expected to bring the price down, it will not bring it down to nothing.

It is true that we think well of tape in Minneapolis, where we have the Minnesota Mining and Manufacturing Company.

But suppose you did three half-hour lectures a week for the academic year. That would come to 104 half hours or 52 hours. Did you know the tape cost for storing up that lecture will run to $12,376? For that course of six lessons a week, this would run to a total cost of $50,000 for operating the network, if we had ten VHF's on the network. That is one point.

Another point is that, if the tapes were made at one place, the tapes would have to be stored for the course—and would have to be mailed to the stations using them. The other way, a Spanish course, say, is sent out three times a week over the network lines. The individual station tape records the programs and sends them out the next day, or two days later, or three hours later—whenever it is convenient. Then the tape is erased, because the next week along comes something else, and this way an investment is not tied up in tape.

On the administrative setup, again the thought was that there would be great difficulty in getting governors and legislatures, and this and that, to agree on network policy. That is right. The informed consensus in this region is that you would set up the same sort of foundation as was set up for a local station in Detroit, Pittsburgh, or wherever—that is a nonprofit corporation. This gets past all the state legal problems. Any school system can buy films or textbooks or other educational supplies and services. The school systems and colleges—in other words, the users of this service—contract with this nonprofit corporation, and, incidentally, this should be set up by all of the participating stations, and hence there should be no more problem on that than in the operation of your own community station. This is what the people want.

And finally, when it comes down to What do you take? or What don't you take? and Can we live with the programs that this outfit will give us or not?—if it comes over the microwave, all one has to do is decide whether or not he wants it on his own station and flip the little switch.

Session VI

STATUS REPORT

Close-up: Florida

Dr. Kenneth Christiansen

Director of Television
University of Florida

The establishment of a Florida ETV network was one of the primary functions assigned to the Florida Educational Television Commission by the 1957 legislature. Chapter 57-312, Laws of Florida, 1957, states these functions as follows:

"1. To establish a television network interconnecting the state's public tax-supported universities and junior colleges and such communities or ETV stations as may be designated by the State Board of Education. . .for the instruction of students at existing and future colleges and universities, including community or junior colleges.

"2. To encourage the activation of reserved educational television channels and the further development of educational television within the state."

The ETV network idea had its beginning with the Florida Legislative Council, which in 1954 undertook a study of educational television possibilities for the state. C. Farris Bryant, speaker of the house, was chairman of the Select Committee on Educational Television which made the study and prepared the report. The committee voiced its approval for use of TV as an educational medium and made a number of recommendations to implement bringing the medium into educational use.

Following his election as Governor of Florida, and just prior to his inauguration, the Honorable LeRoy Collins appointed a Special Citizens Committee on Educational Television to make recommendations to him on educational television and uses of the nine reserved educational television channels for Florida. This committee, in its report completed on December 20, 1954, also voiced its approval of the use of television as an educational medium and, among other things, recommended that some consideration be given to the formation of a state-wide authority or commission on educational television which would explore the idea of the complete use of educational facilities within the state.

The Delegate Assembly of the Florida Education Association, meeting in Tampa in 1955, in one of its resolutions stated: "The Association here assembled wishes to commend the Select Committee on Educational Television and its report to the Florida Legislative Council and to commend Governor Collins for his foresight in appointing a Citizens Committee on Educational Television."

"And, further, looking toward long-range developments in educational television in the State of Florida, the Florida Education Association hereby goes on record as favoring the placement of final authority for educational television with the existing constitutional authority for education in the state, namely, the State Board of Education."

Florida's Educational Television Commission was appointed by Governor LeRoy Collins under the terms of the 1957 legislation. Judson Freeman, a Jacksonville lawyer, serves as chairman. Other members of the commission are Stan Witwer, associate editor, St. Petersburg Times; J. Kenneth Ballinger, secretary, Florida Association of Broadcasters; Niles Trammell, former NBC president, now a Miami commercial station operator; J. J. Daniel, lawyer and member of the State Board of Control; James L. Wattenbarger, director, Division of Community Junior Colleges, State Department of Education; and, representing the public schools, Floyd T. Christian, superintendent of public instruction, Pinellas County, St. Petersburg.

James L. Etheridge, Jr., is the commission's executive secretary. Two consulting engineers are employed: Dr. W. J. Kessler and Ovid R. Gano, Sr., University of Florida.

The commission's responsibility essentially is that of the physical network—its installation, operation, and maintenance.

A committee of professional educators—the Committee for Relating Public, Secondary and Higher Education, appointed in July, 1957, by Governor Collins, and representative of all levels of educational institutions in Florida—assumed responsibility for launching a study of TV curricula and programing at the request of the commission. Membership of this committee includes: the chairman—Dr. J. L. Wattenbarger, director of community junior colleges, State Department of Education; Dr. Michael M. Bennett, president, St. Petersburg Junior College; Dr. Myron R. Blee, educational and research officer, Board of Control; Dr. W. Hugh Stickler, Florida State University, director of educational research and service; Dr. J. Hooper Wise, professor of English and head of Department 3-C, University of Florida; Mr. Sam H. Moorer, director, Division of Instructional Field Services, State Department of Education; and Mr. Elton L. Jones, supervising principal, Ocala Schools.

This committee has appointed a "task force" to assist it in development of its programing plans. The "task force" assignment has included the following functions:

1. Bringing together those who are concerned with programing on the network facilities being developed by the ETV commission.

2. Determine what programs should be developed for initial use on the ETV network.

3. Determine what resources in manpower facilities and funds are required to develop these programs.

4. Recommend programs and request resources needed.

5. Develop and/or arrange for the development of programs.

6. Stand ready to cooperate with the ETV commission in programing on the network once it comes into operation.

7. Stimulate and coordinate research in ETV and act as an advisory body for Florida's participation in Title VII of the National Defense Education Act as it relates to television.

All five of Florida's VHF stations will be in operation by January 1, 1960. Presently operating are: Channel 2, WTHS, Miami, Florida's first ETV operation; Channel 3, WEDU, Tampa-St. Petersburg; Channel 5, WUFT, Gainesville; and Channel 7, WJCT, Jacksonville. Channel 11, WFSU, Tallahassee, has January 1, 1960, as its operating target date.

The commission has played a major role in these station developments, with equipment and facility assistance. Also, the start of the network hookup is a reality, as indicated by the following:

St. Petersburg-Tampa Link

Interconnects St. Petersburg Junior College with the Channel 3 ETV station, WEDU, at Tampa, which in turn provides a broadcast interconnection available in all classrooms of St. Petersburg Junior College and Gibbs Junior College, St. Petersburg, and Manatee Junior College, Bradenton.

Gainesville-Jacksonville Link

Interconnects the University's Channel 5 ETV station, WUFT, at Gainesville, with the Channel 7 ETV station, WJCT, at Jacksonville, so that courses and programs produced at either station may be broadcast by the other. The Gainesville station also serves Central Florida Junior College and Hampton Junior College, Ocala; and St. Johns River Junior College, Palatka.

Dade-Broward-Palm Beach Interconnection

Will interconnect the state's oldest ETV station, operated in Miami for three years by the Dade County School Board, with one of the state's oldest and largest junior colleges—Palm Beach Junior College—and with Roosevelt Junior College, West Palm Beach.

(The commission's cooperative agreement with the Dade County School Board to increase coverage of the Channel 2 ETV station at Miami provides the following: (a) a southeast Florida studio production center for the proposed state-wide network; (b) the first step in the northbound interconnection with Palm Beach Junior College; (c) extension of broadcast educational television service throughout Dade and Broward counties; (d) facilities for broadcasting junior college courses for credit if and when priority-one junior college projects are authorized in Dade and Broward counties.)

Florida State University ETV Station and Studio Production Center

This proposed Channel 11 broadcasting station will make college courses for credit available to all classrooms of Florida State University and Florida A. & M. University, Tallahassee; Chipola Junior College, Marianna; North Florida Junior College, Madison; and possibly (depending on engineering factors) Gulf Coast Community Junior College and Rosenwald Community Junior College, Panama City.

To complete the network, the following links have been proposed as funds become available:

Gainesville-Madison-Tallahassee Link

To connect the state's three existing universities which, via ETV broadcast stations at Gainesville and Tallahassee, will also provide courses for credit to junior college classrooms in their areas.

Tallahassee-Marianna-Panama City-Pensacola Link

Extending west from the proposed studio and ETV station at Florida State University, to serve junior college classrooms at Marianna, Panama City, and Pensacola.

Gainesville-Palatka-Daytona Beach Link

To interconnect studios of the university station at Gainesville with classrooms of junior colleges at Palatka and Daytona Beach.

Florida builds its case for ETV and its ETV network on the following assumptions:

1. By its very name and its recognized purpose, ETV suggests planning and systematizing of experiences needed to build attitudes, concepts, and skills.

2. ETV can be used to help intensify the educational experience for young and old alike. When moved to the center of administrative practices, it is an educational tool that can help create time for closer student-teacher relationships. Through deployment of staff and faculty, additional or even new services can be added to a system. (Miami with its staff saving has deployed teachers to assignments which make it possible to reduce class size in certain skill areas and to add counselling and other student personnel services.)

3. ETV, using the resources of the best teachers and creative production staff, can demonstrate the vitality of ideas and showcase education as something that is live and dynamic—the kind of demonstration that can earn new support and vigorous defense for the educational system.

4. This vigorous, dynamic teaching can help bring new respect and new prestige to the teaching profession. The creative teacher has in this new opportunity the vehicle for demonstrating that the life of reason can be as exciting as the life of the senses. It should be added, however, that to do this it must provide teaching that is not just word deep but a live encounter with new ideas and new and meaningful experiences focused on the lives of students. It is teaching rooted in creative thinking more than in uninspired doing.

5. ETV can help Florida welcome the expansion of student population. Each week 2,000 permanent residents come into Florida. One-fourth of these are of public school age. Every four hours of the year enough new pupils arrive to require a new public school classroom and another teacher. Florida looks on the expanding school population as a challenge to be met and inherent in it an opportunity to create a vast audience for culture and abundant living—an opportunity to combat the two kinds of poverty suggested by Richard T. Ely in his "Outline of Economics": (a) the lack of goods for the higher wants, and, (b) the lack of wants for higher goods.

6. The ETV network in Florida can provide an economical showcase for those otherwise unavailable on an individual classroom basis—artists, busy and occupied scientists, businessmen, and statesmen.

7. The ETV network can be an incentive to develop closer contact and better liaison at all levels of education. A system of networking can be a fruitful forerunner of the kind of articulation and interconnection needed to link the educational facilities of a state.

8. ETV networking can bring immediacy and currency to the political and foreign policy issues of the day. In this virtue of mass media distribution are opportunities to stress better understanding of world cultures and international relationships. For surely we must agree that bias and ignorance in our day are aspects of immorality.

9. Programs of Florida's ETV network can be instrumental in the effort to penetrate the vast reaches of the mind. ETV can make a significant contribution to the conquest of "inner space." There is in Florida the symbol of man's effort to conquer outer space. That symbol is Cape Canaveral. Mammoth telescopes and sensitive tracking instruments follow, record, and report our efforts at exploring outer space. We spend freely to develop the rockets and satellites, but we do so little to chart and study the eccentric orbit of human personality. From these outer space operations may come useful insights and information on what the other side of the moon looks like. But we know too little or understand in such meager ways the billions of light years that separate the worlds of two groups of people, two nations, or even two persons living in the same room. ETV as a part of a great technological advance can help in this responsibility.

But to make meaningful a program of action based on these assumptions, the ETV network effort must be more than televised education. Its program people must be selective in the choices they make.

Thus, the network program development during the next two years will be directed to the following:

PROGRAMS OF SYSTEMATIC INSTRUCTION AND PROGRAMS OF COURSES FOR CREDIT

Systematic instruction as herein defined means that a topic or topics are developed in an orderly progression, are of an informational nature, and are designed to instruct people about a subject or an idea in a systematic or organized way, but with less of the formality than characterizes the course-for-credit offering.

The first courses for credit will be at junior college level. Twelve 3-hour courses will be taped for network distribution. The Junior College Liaison Committee has already identified one course, "Humanities." One of the continuing assignments of this committee is to identify the other courses. Shortly after the start of the 1959-60 academic year, the junior college needs will be reassessed in view of: (a) those demands which arise from increasing enrollments, (b) where competent teacher shortages exist, and (c) subject matter areas in which teachers of that area are of a disposition to accept television.

IN-SCHOOL PROGRAMS

(Including courses for credit, systematic instruction, and enrichment)

An educational television network must also serve the public school. Although the legislation which created the network designates the junior college function, the facts of broadcast life are that a broadcast licensee must serve in the general public interest, convenience, and necessity—which in itself broadens the scope of the broadcast effort.

The articulation committees of superintendents, principals, and directors of instruction, will be asked to assist in identifying the in-school program needs. These committees will: (a) identify the critical instructional needs of the state without reference to television or other educational tools, (Once these critical needs are assessed, then the discussion of where television fits in can proceed from that point.), and (b) recommend procedures for financing and supporting the educational television broadcast effort.

COURSES

Courses for Credit—It is our feeling that the determination of these courses will come after local experience in the several station locations has demonstrated practical uses of television at the upper-division level. Total acceptance of television or even partial acceptance of television is not accomplished overnight. The climate for television must be built. This is done best at the local level where staff concerned with educational television has an opportunity to work closely with the television committee or department or with individuals in departments working toward at least experimental uses of the medium. Experience makes people less fearful of the medium and more willing to accept it.

Systematic Instruction—It would seem that first efforts in systematic instruction at the upper-division level should be made in the area of utilizing the resources of the specialists in our educational institutions. These persons would be used as talent for shorter systematic-content-type programs. Programs to be developed would:

1. Update information in the several disciplines—something in the nature perhaps of two or three programs in a given area of specialty. For example, the university's nuclear reactor plant places at the disposal of the state a new instrument in science. The information—that is, that which is not classified—can be reported by the scientists concerned, recorded on tape, and then sent out as network offerings for broadcast and use by science groups in their respective areas. In the areas of economics, geopolitics, etc., the same would apply.

2. Utilize the specialist to provide currency to topics of immediate or current concern and of a timely nature: politics, government, public issues.

3. Report research and activities out on the cutting edge of the frontiers of knowledge of the various disciplines.

4. Summarize and bring up to date those materials which are not readily accessible in textbooks or in the experience of teachers in the several fields.

Conceivably in the frontiers area alone a half-hour program should be developed for presentation every six months in the fields of the humanities (literature, art, music, dance, drama), the social sciences, the physical sciences, the natural sciences, and languages and communications. This assignment would constitute ten half-hours a year. In the summarization side, an hour's program every six months easily could be devoted to each of these areas, accounting for another ten hours of programing of state-wide interest and utility. In these areas of systematic instruction, the professional groups and research groups should serve as the council to recommend the programs and the talent resources available to do such programing. The "task force" should identify and name the membership of such councils.

ADULT EDUCATION

Adult education needs will be identified by a council representing the Florida Department's Adult Education Division and the General Extension Division. Network criteria will be applied in final selection of programs. Programs will be identified which could be offered for extension credit and which are of general cultural and educational interest but not offered for credit.

STATE AGENCIES

The county system, while it has many drawbacks, does identify a point of organizational contact readily available for advice and counsel on agency needs. For example, while the state Department of Health may be the principal advisor on programs, the county departments can easily be identified as sources of resource people, sources of program materials and aids, and the principal energy for organizing discussion groups, adult study groups, etc., important in such program efforts. The same holds true for all of the departments and agencies within the state.

Great impact can come from a state-wide attack on a problem. For example, ten problem areas might be identified in the area of gerontology. On the same night, at the same hour, these programs would be carried by the five ETV stations for ten successive weeks. The state-wide information and publicity program that would be planned as part of such a series would gain national attention. Here state agencies, such as the health departments could spearhead and energize the planning of local discussion groups and the follow-up.

INDUSTRY

Industry support for educational television will be forthcoming at a point at which services to industry can be clearly identified. In order to achieve local cooperation and support, it is suggested that the five TV stations be considered as organizing points for encouraging industry support and that procedures be established whereby an industry council would be appointed to advise stations on the kinds of industry needs which might be served by television—for example, mathematics for engineers, rapid reading techniques for executives, safety and accident prevention, work simplification.

While the completion of the Florida state-wide microwave facility must wait on future legislative appropriations, the "networking" idea will proceed with the use of the videotape facilities. Videotape recorders are or will be installed in four of the five ETV stations by the first of January, 1960. At this writing, WEDU, Tampa, and WUFT, Gainesville, have qualified for recorder grants from the National Educational Television and Radio Center, as well as grants of tape from the Minnesota Mining and Manufacturing Company. The other VHF ETV stations are expected to qualify for recorder grants in the near future. The Florida ETV Commission has purchased and assigned one tape machine to WUFT, Gainesville, where it is now possible to duplicate tapes for network distribution. Moneys for two additional tape recorders have been budgeted.

During the next two years, the commission, the Committee for Relating Public, Secondary and Higher Education, and the task force of the latter body will:

1. Explore educational uses of the tape network from a broad base encompassing public schools, junior colleges, universities, adult education, state agencies, and industry.

2. Identify experiments needed to demonstrate the potential uses of the tape network.

3. Through experiments and pilot program efforts, assess the practicability of the network concept by:

a. Determining the present student-per-credit-hour cost of instruction by TV using the tape network facility.

b. Determining institutional arrangements necessary to insure the most economical use of the taped instructional offerings. Such related questions as these would be considered: To whom (agency, administration, office) should management be entrusted? How much and what kind of coordination of individual institutional programs is necessary to insure effective network operation?

c. Establishing cost procedures for tape network production and operation.

d. Working out methods by which participating institutions, within the existing governmental framework controlling institutions, can assume costs of program utilization.

e. Developing policy recommendations which would be used to determine such things as released time and/or remuneration policy for faculty members doing ETV programing, residual rights of faculty members in taped courses, and accreditation.

These questions and many others not yet raised will face the group responsible for Florida's educational television network development. The central mission remains—improved educational experiences for all the audiences that TV can serve.

Session VI

STATUS REPORT

Close-up: Alabama

Mr. Raymond D. Hurlbert

General Manager
Alabama Educational Television Commission

Alabama, the first of fifty states alphabetically, is proud to be the first in establishing a state-wide educational television network. At the insistence of prominent state educators and with the wholehearted support of Governor Gordon Persons, members of the State Legislature provided for setting up a state educational television commission to devise a system for utilizing allocated educational television channels, and also made an appropriation for this purpose.

Today the educational eyes of the nation are studying the Alabama educational television network. Several states are viewing this ETV operation with plans for similar organizational patterns that might function in their localities.

The Educational Television Commission, through long-range planning, has gradually established a network of three strategically placed VHF stations tied together by microwave, which reaches approximately 78 per cent of the state TV homes. This accomplishment was made with the assistance of the firm of Norton and Holt of Birmingham, on organizational and business aspects; the law firm of Hogan and Hartson in Washington, D.C., as legal counsel; and A. D. Ring and Associates, Washington television consulting engineers, as technical counsel.

The Alabama Educational Television Commission is charged by law to set up and operate all educational television in Alabama. While the Alabama Educational Television Commission directly operates the network, arrangements were made for three programing agencies to supply the network programing. These agencies are autonomous in producing programs, each filling one-third of the network time. Because the idea for an educational television network was a part of the Alabama Educational Television Commission's original planning, there has developed naturally a cooperative attitude on the part of all units involved throughout the initial stages as well as through subsequent developments. The present democratic plan of mutual support and active participation on the part of the public schools, the institutions of higher learning, and the AETC has proved itself as a most effective and successful arrangement.

FINANCIAL BEGINNINGS

On June 15, 1953, the Alabama State Legislature established the AETC and appropriated $500,000 for the activation of available ETV channels. Action began with the construction and operation of Channel 7, WTIQ, located atop Mount Cheaha. The Storer Broadcasting Company donated broadcasting equipment valued at $200,000 for the establishment of Channel 2, WBIQ, located atop Red Mountain in Birmingham. The Alabama State Building Commission appropriated $403,000 for construction of buildings and studio facilities at the University of Alabama and Alabama Polytechnic Institute. The University of Alabama received $100,000 from the Fund for Adult Education, for additional studio equipment. The Alabama State Building Commission in 1956 appropriated $9,640 for the construction of a transmitter building for Channel 2 at Dozier, Alabama. The commission received $10,000 from the Emerson Radio and Phonograph Company for having established one of the first ten educational television stations in the nation. The 1955 Alabama legislature appropriated $195,000 per annum for two years for operational purposes. Each biennium since 1955 the Alabama State Legislature has appropriated approximately $200,000 annually for the operation of the network.

With funds appropriated to the participating studio production centers, the total of all appropriations for ETV in Alabama approximates $450,000 annually.

OPERATIONAL BEGINNING

Channel 7, WTIQ, went on the air January 7, 1955. Channel 10, WBIQ, went on the air April 28, 1955, and on August 8, 1956, Channel 2, WAIQ, joined the two other stations to carry educational television programs simultaneously on all three stations. These stations are joined by twelve microwave relay installations. The three VHF transmitters receive programs originating from the three programing agencies—the University of Alabama, Alabama Polytechnic Institute, and the Greater Birmingham Area Educational Television Association. Two-way radio connections between transmitters and programing agencies expedite the coordination of programing.

The AETC operates all three stations and connecting equipment. The three programing agencies operate their own studios, working cooperatively with the AETC for the production of a rounded, balanced, and coordinated schedule of programing.

PROGRAMING THE ALABAMA NETWORK

As licensee of the three channels, the AETC has contracts with the three abovenamed agencies to provide programs for the network. Each agency from its modern television studio supplies approximately one-third of the 67 1/2 hours of daily broadcasting which runs from 8:30 A.M. to 10:00 P.M.

The interpretation of programing policy and implementing production for the network is the delegated responsibility of the program board appointed by the commission and composed of the following members: the president of the University of Alabama, Dr. Frank Rose; the president of Alabama College, Dr. Howard Phillips; the superintendent of Jefferson County Schools, Dr. I. F. Simmons; the president of Alabama Polytechnic Institute, Dr. Ralph Draughon; and the state superintendent of schools, Dr. Frank Stewart.

An article by Mr. Raymond D. Hurlbert, general manager of the Alabama Educational Television Commission, which appeared in the State Government Magazine, February, 1956, states: "It is the position of the commission that educational television is an extension of public education and that, therefore, the same general principles which govern teaching in the public schools also apply to educational television teaching."

"In the above-described organizational pattern, the AETC has endeavored to safeguard programing from political involvement or from being used for propaganda purposes. The AETC provides that the above-mentioned agencies operate their studios under their own authority. With this plan in effect, the commission believes that the establishment of the program board and the subsequent contracts for programing with the three agencies, affords the best possible arrangements for democratically programing the network."

Each programing agency has a director who is nationally known for his knowledge and outstanding ability. The director of broadcasting services at the University of Alabama is Mr. Graydon Ausmus; director of educational television at Alabama Polytechnic Institute is Mr. Edward Wegener; and director of the Greater Birmingham Area Educational Television Association is Dr. Frazer Banks.

Programing for the network is coordinated in the office of the commission by Mr. Lou Peneguy, director of coordination and information, who works with the directors of the programing agencies and ties together the various programing elements of the network into an organized, workable schedule. As director of public information, Mr. Peneguy issues all program and news releases to the press and other publications.

Through the facilities of the Alabama Educational Television Network, viewers have been afforded the opportunity of enjoying the first complete telecast of an opera on educational television in the nation when the University of Alabama presented "La Boheme." Alabama citizens are now receiving college credit for courses being taught via television from the University of Alabama. During the summer, high school students have been doing remedial work in basic subjects as taught over the network. The Alabama State Board of Education gives credit for approved ETV courses toward a high school certificate.

The selection of Alabama telecourses is based on the results from a questionnaire sent to superintendents and principals early in the year. Those courses heavily requested are scheduled by the studios. Five thousand in-school schedules are distributed at the annual March Alabama Education Association convention, in order to help the principals align the telecourse schedules with their classroom schedules.

Teachers who indicate that they will use the course the following semester are invited to attend a summer workshop. There they learn how to fully utilize the ETV presentations as well as assist the TV teacher with the outline (study guide) for the course. These guides are for both the fall and spring semesters. They are printed and distributed free to all classroom teachers who use telecourses. The in-school project courses are jointly supported by the Fund for the Advancement of Education (Ford Foundation) and the State of Alabama.

Some 75,000 Alabama school children now study in their classrooms in more than 450 schools through television instruction designed for supplementary instructional and enrichment purposes. Schools across the State of Alabama unable to employ special teachers for subjects such as music, art, physics, etc., can now study those subjects via television. The classroom teacher can follow the lesson in the teacher's manuals and guides prepared by the programing agency in cooperation with the state Department of Education.

Being the only state-wide ETV project in the U.S., the entire project is being closely studied nationally through The Associated Consultants in Education, in cooperation with a research team working with the state Board of Education in Montgomery.

Through the Hill-Elliot Act, schools have been able to buy more TV sets for science, math, and foreign language study. Channel 10's coverage has been doubled by our antenna's going up on WBRC's new 785-foot tower. The latest development is the use of our ETV signal by the Florence, Alabama, commercial cable service to bring ETV to that part of the Tennessee Valley area.

More students than ever will be able to utilize ETV in Alabama this year. A number of new courses, including Russian, have been added this year to the curriculum. Daily at 2:30, leading corporations, in cooperation with the NETRC and NBC through the University of Alabama, are presenting a new teacher-training refresher, and a college advanced course in modern chemistry. Immediately afterwards at 3:00, Dr. Harvey White repeats his highly publicized "Continental Classroom" advanced physics.

Mondays at 3:30, Auburn TV airs a teacher-refersher guidance series. For the benefit of teachers using ETV for the first time, September 9, 10, and 11, the network presents, from 3:00 until 4:00, a special instructor's workshop series designed to be followed on the classroom sets after school.

The following is an alphabetical list of direct-teaching telecourses planned for this fall. All courses are based on the Alabama State Course of Study. Unless otherwise noted, all courses are at the high school level. Free study guides are provided for each subject listed below. Listings show the course, time, dates to be presented, instructor, and telecast studio origination. (Enrichment and supplemental lessons are not listed here due to space limitations.)

Alabama History - 10:30 A.M. - Monday through Thursday. Bettye Watson, Birmingham.

Biology - 10 A.M. - Monday through Thursday. Mrs. Mary Rogers, Birmingham.

Chemistry - 10 A.M.- Monday, Wednesday, and Friday. UA Dean Robert D. Brown, University.

Chemistry - (Advanced: College Prep) - 2:30 P.M. daily. (Produced by NBC for NETRC and UA)

Guidance - 2 P.M. - Monday, Wednesday, and Friday. Margaret Vines, Birmingham.

Physics - Noon - Monday, Wednesday, and Friday. Dr. Charlotte Ward, Auburn.

Russian - 8:30 A.M. - Daily, except Wednesday. UA Professor Anthony Hull, University.

Science - (Junior High) 11 A.M. and 1 P.M. - (repeat) - Monday, Wednesday, and Friday. Victor Kerns, Auburn.

Science - (Upper Elementary) 9:30 A.M. - Monday, Wednesday, and Friday. Dr. Charlotte Ward, Auburn.

Spanish - 11:30 A.M. - Monday, Tuesday, and Thursday. UA Dr. Hubert Mate, University (also, for Upper Elementary, Wednesday and Friday sessions)

Each day's program schedule offers in-school programs, after-school programs for children, and evening programs for adults. The following are but a few of the program offerings on the educational network which are available to all the citizenry of

Alabama: child care, languages, history, home economics, agricultural news, music, art, social and political discussions, public service, learning how to play the piano, learning how to play bridge, and do-it-yourself projects for the home.

WHERE CREDIT IS DUE

Educational television opportunities for the citizens of Alabama are due to the courage and action of Former Governor Gordon Persons; the support of succeeding governors and state legislatures; the dedicated public service of the Alabama Educational Television Commission, which is composed of the following: Rex Sikes, president, Mr. Maynared Layman, Mr. Vincent Kilborn, Mrs. Bertha Roberts, Mr. Harold Purdy, and the professional service of Raymond Hurlbert, the general manager who also served as the first president of the AETC; and the support of citizens, educators, volunteer workers, program talent, the programing agencies, the institutions behind them and the professional staffs of each, the Alabama press, and commercial radio and television stations. All have played an important role in making this unique educational television network possible in Alabama.

The philosophy behind the development of educational television in Alabama has been very important in shaping the whole program: "If what was already being done in public education is sound, then it is sound to use television to bring it to more people."

On the completion of the three-station Alabama ETV network, Dr. W.R.G. Baker, past vice-president of General Electric, stated, "Educational television in the United States might well rise or fall, depending on the success of the Alabama ETV operation." Certainly Alabama is setting a positive example of the value of educational television in the general structure of public education.

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Session VI

STATUS REPORT

Close-up: Wisconsin Radio

Mr. William G. Harley

Program Director, WHA
University of Wisconsin

From the time of radio's earliest beginnings, the State of Wisconsin has seen in this instrument great potentials for education and public service. Since 1919, when experimental station 9XM began regularly scheduled telephonic broadcasting, the University of Wisconsin has used radio as a means of extending its service to the state. In 1922 the call letters WHA were assigned.

In its more than forty years of operation, WHA has evolved into a force which gives the university and other divisions of the state their most constant, frequent, and immediate contact with the citizens of Wisconsin. But it was not until the construction of the state FM network, which extended WHA programs to every county in the state, that such a force came into being.

HISTORY AND DEVELOPMENT

Actually, the FM network was preceded by an AM network of sorts. WHA, in Madison, was linked by line to Station WLBL, Stevens Point, in the north central part of the state. This station, which had been operated since 1922 by the state Department of Agriculture, rebroadcast the "School of the Air" programs originated in Madison and the "Daily Homemakers" and "Farm" programs. The combined coverage of both AM stations, however, failed to provide for many areas of the state. Moreover, since both were daytime-only stations, they were unable to serve the thousands of citizens who, because of work or other commitments, were unable to listen during daylight hours.

Efforts to secure better channel assignments to expand power and hours proved futile. Then came FM with its static-free, high-fidelity qualities, and possibilities of providing a solution for Wisconsin's frustration in radio—limited coverage and limited hours.

The decision of the FCC to set aside a portion of the FM spectrum for education gave Wisconsin an assignment of eight channels reserved for noncommercial, educational use. Based on these assignments, engineers came up with a plan for a network of FM stations connected by off-the-air relay that would provide service over the entire state. Administrators, studying the plan and weighing all the factors, made the considered judgment to put Wisconsin eggs for radio development into the FM basket. They began a campaign to activate the plan.

In 1945 the State Legislature took action on a proposal creating the State Radio Council, a public body representing a wide range of interests and public services, whose purpose was to "plan, conduct, and develop a state system of radio broadcasting for the presentation of educational, informational, and public service programs," and appropriating funds for two FM stations.

The initial station, WHA-FM, went on the air March 30, 1947.

Successive legislatures provided for two additional stations each biennium until in 1952 the last two stations were constructed and the network of eight FM stations was completed. This gave Wisconsin the nation's first (and only to date) state-wide noncommercial radio network.

FACILITIES

Combined with the two AM stations, the FM network provides a state-wide broadcasting service of ten stations:

WHA-FM	3 kw	Madison
WHAD	10 kw	Delafield
WHKW	10 kw	Chilton
WHRM	10 kw	Rib Mountain
WAWC	10 kw	Colfax
WHLA	7 1/2 kw	West Salem
WHH	10 kw	Highland
WHSA	10 kw	Brule
WHA(AM)	5 kw	Madison
WLBL(AM)	5 kw	Stevens Point

Transmitter sites were based on height above surrounding terrain and the possibility of using existing state-owned land. In three instances, transmitters were located in state parks.

The entire network (with minor exceptions) is programed from Madison, with the broadcasts originating in Radio Hall on the campus of the university. WHA-FM serves as the key station with the programs being transmitted from one station to the next via off-the-air pickup, and rebroadcast. In case of failure of a link in the chain, the direction of pickup can be reversed or various cross connections utilized.

To take care of power failures, each station is equipped with an emergency gasoline-driven power generator. WHA-FM, as the originating station, has a duplicate stand-by transmitter which can be put into service within forty seconds.

Although in the beginning it was thought that studio facilities might be needed at some of the state colleges, this did not turn out to be necessary. The advent of audiotape, with the flexibility it provided of obtaining programs from all over the state and shipping them to Madison for insertion in the schedule, proved to offer a more practical and satisfactory means of obtaining program materials from around the state.

PROGRAM SERVICE

By extending the voice of the university, the network has truly implemented the university's slogan "The boundaries of the campus are the boundaries of the state." Further, the radio network has proved a cohesive force in bringing the state government closer to the people and the people closer to their government. Whereas before, the people on the borders were being drawn away from the university by the attraction of listening to radio programs emanating from Minneapolis, Dubuque, and Chicago, the availability of the Wisconsin State Broadcasting Service in all parts of the state has tended to cement state loyalty and draw Wisconsin citizens into an even more intimate relationship with their state and university.

The FM network is currently on the air from 7:15 a.m. to 10:30 p.m., Monday through Friday, and ten hours on Sunday, for a total each week of 83 3/4 hours. The schedule is a diversified one providing offerings to meet a variety of needs and interests.

The network seeks to serve agriculture, by furnishing vocational and market information; households, by furnishing information on care and conduct of the home; schools, bv supplementing the instruction with specialized teaching talent; adults, by furnishing educational and cultural opportunities not otherwise available; public agencies, by providing means for extending their services directly to the people; informed public opinion, through discussion of questions of public policy.

The network does not attempt to serve all of the people all of the time—but rather some of the people especially well all of the time. The result is a unique service, built especially for minority audiences which are not otherwise well served by radio.

The program structure is designed especially for the people of Wisconsin. The network has no regular national wire network connection, though outstanding programs from other educational institutions are available from the NAEB tape network.

Prominent in the program schedule are the "Wisconsin School of the Air" (supplementary programs for elementary school classroom teaching), the "Wisconsin College of the Air" (university classroom lectures and specially planned studio courses), "Farm Program" (market and farm information), "Homemakers Program" (a daily broadcast for women of news, commentary, and information), a generous portion of good music in four daily concerts, and a wide variety of other features emanating through state organizations and agencies as well as national sources.

IMPACT OF NETWORK FEATURE

Four types of program activity indicate the importance of the network feature—the simultaneous state-wide transmission—to the program service.

POLITICS AND GOVERNMENT

A unique service of the network is the longstanding program of political education. All qualified candidates for state and elective office in the primary elections are allowed free time to state their cases—thus permitting all candidates, regardless of their financial resources, to speak to the citizens of the state. In the regular election forum, time is equitably allocated to the parties and independent candidates.

Every weekday during sessions of the State Legislature, legislators are given an opportunity to report to their constituents back home via broadcasts direct from a special studio in the state capitol. In addition, frequent actuality reports are made of legislative hearings so that radio enables citizens to listen in on an important part of the legislative process.

Thus the network gives legislators an opportunity to tell what they will do if elected; and if elected, to report on what they are doing.

THE WISCONSIN SCHOOL OF THE AIR

Next week the "Wisconsin School of the Air" will begin its twenty-ninth year of supplementing instruction in the elementary grades of schools all over Wisconsin. Based on last year's figures, nearly 300,000 youngsters will listen each week to an average of two and one-half programs brought into their schoolroom by the nearest station of the state radio network. Ten programs will be offered in subjects ranging from experimental science and American history to foreign languages and creative art. In the "Let's Sing" program, for example, 100,000 youngsters will raise their voices together as they follow the professor's direction from the studio in Madison.

WEATHER AND HIGHWAY INFORMATION

Service reports dealing with road, weather, and emergency situations are provided daily. Such information, official and up-to-the-minute, is used by farmers, fruit growers, travelers, truckers, flyers, and others whose activities are affected by the weather.

Besides the AAA road-condition reports and the regular U.S. Weather Bureau direct reports from Truax Field in Madison, the network presents a unique weather roundup twice daily utilizing state-station operators to report current conditions at their respective transmitter sites. These reports are followed by a summary and interpretation by a U.S. meteorologist.

SPORTS BROADCASTS AND SPECIAL EVENTS

Through arrangements with the university athletic department, broadcasts are originated by WHA for all football and basketball games both at home and away. Not only are these programs available from the state network, but many commercial stations in Wisconsin and surrounding states carry the game reports. By means of off-the-air pickup from the nearest state FM transmitter, stations in remote areas of Wisconsin have available to them programs they could not afford if obliged to pay broadcast line charges. In this way programs from the campus—including "School of the Air," farm and homemakers' programs, weather and market information, and special events such as U.W. commencement, convocations, and special concerts—are generally available throughout the state.

THE WISCONSIN COLLEGE OF THE AIR

This title covers the organized courses and series of programs constituting the systematic instructional programs for adults. Included are regular university courses originating from campus classrooms and specially prepared series presented from the studios of Radio Hall.

Such courses provide adults the opportunity of going to college at home. Together with the broadcasts of concerts by the Pro Arte Quartet, in residence on the campus, and many other musical groups, there are presentations of special lectures and convocations, interviews with foreign visitors and national figures, and frequent discussions and interpretations of current issues by faculty scholars and experts—through these, the people of the whole state share by radio in the many resources available to the university community.

ADMINISTRATION

The State Radio Council consists of nine members: the governor or his representative, the president of the University of Wisconsin or his representative, the superintendent of public instruction, the secretary of the Board of Regents of State Colleges, the director of the State Board of Vocational and Adult Education, and three citizen members appointed by the governor. Thus the council represents the entire educational establishment of the state, plus the general public.

The responsibility of the state radio program service is shared by the council and the university. The university provides programs for its daytime AM station, WHA. The council, which operates eight full-time FM stations plus WLBL, uses the daytime programs of WHA and produces its own programs for the evening hours. Both agencies recognize that they are contributing to the same over-all project and the relationship is a harmonious one with all stations carrying the same service. The council looks to the university for its contributions to the program service, and the university looks to the council for transmission facilities over which the programs can be heard throughout the state.

The program activities are coordinated through the sharing of the appointments of key administrative personnel by the university and the council. In addition WHA studios and offices in Radio Hall are shared with the council. This makes for efficient operation and avoids duplication of equipment, facilities, and personnel.

COSTS

Current appropriations for operation and maintenance of the state radio stations are as follows:

Station WHA (University of Wisconsin)	$185,000
8 FM stations and WLBL (Radio Council)	$240,000
	$425,000

The WHA budget includes the program staff of the "School of the Air" and other program and administrative personnel engaged in the production of programs originated by WHA—hence the seeming disparity.

Annual operating costs for the state radio service, on a per-capita basis, are less than ten cents per person to Wisconsin citizens—the tax on a gallon and a half of gasoline, or the cost of a third of a package of cigarettes.

The physical plant of the ten stations represents a capital investment of approximately $600,000. WHA and WLBL were built up gradually through the years. The FM station appropriations total $488,095. The investment for physical facilities capable of serving virtually all of the 3,800,000 inhabitants of the state is, accordingly, less than eighteen cents per person. The cost of constructing the state radio network is the same as the current cost of construction for a school to house five hundred students, a small fraction of the numbers served by radio.

PERSONNEL

Five administrative and technical personnel hold joint appointments between the university and the council.

Other employees on the council payroll last year included 21 full-time civil service workers (mainly transmitter operators) and 12 part-time workers. The WHA staff included 23 full-time employees (6 faculty, 17 civil service) and 8 part-time student workers.

LISTENER APPROVAL

How many citizens are served by the state's radio programs? There is no exact answer. We have, however, indications of listener approval.

"Wisconsin School of the Air" enrollments have risen steadily through the years to a high last year of 711,273.

Listeners' fan mail provides another index of interest and approval. Listener mail, which fell off only slightly during the five years of television's major growth, has begun to climb back up, and last year totaled 20,462 letters or cards.

Truly, Wisconsin's radio network would have gladdened the heart of an early president of the university who said, "I shall never rest content until the beneficent influences of the University of Wisconsin are available to every home in the state." The State Broadcasting Service, by extending the service of University Station WHA, has successfully implemented that dream beyond his wildest imaginings.

Session VI

STATUS REPORT

Closed-Circuit Television

Dr. Leslie P. Greenhill

Associate Director
Division of Academic Research and Services
Pennsylvania State University
Chairman
NAEB Closed-Circuit Television Committee

DEVELOPMENTS IN INSTRUCTIONAL TELEVISION

During the past five years there has been extensive experimentation with the use of television for the presentation of classroom instruction at both the public school and college levels.

At the public school level this development has usually involved the broadcasting of courses into widely scattered school classrooms. However, a number of public school systems are experimenting with closed-circuit television, either within a school building as at Evanston, Illinois; within a community as at Corning, New York; or within a county as in the case of the Hagerstown project in Maryland.

At the college level, closed-circuit television is being used extensively now for the regular presentation of courses on a great many campuses. According to a survey published by the Joint Council on Educational Television in July of last year, some 119 educational institutions own and operate some 133 closed-circuit television systems. In addition, there are 21 such installations used in military bases for instructional and training purposes. During the past year many additional systems have been put into operation, but an accurate count is not available at this date.

USES OF CLOSED-CIRCUIT TELEVISION

Regular Classroom Instruction — Perhaps the most important and extensive use of closed-circuit television is for the presentation of regular classroom instruction to students located in multiple classrooms. It is clear from the extensive research on this application that television can be used as an effective method for extending outstanding teachers to large numbers of students. In addition, television makes it feasible to bring to these students learning opportunities that it would be otherwise impossible or impractical to use under normal classroom conditions. This research has been adequately summarized elsewhere and it is therefore unnecessary to review it here.

Magnification of Demonstrations in Auditoria and Laboratories—A second major use of closed-circuit television is for the presentation of demonstrations so that they can be observed by all students in a large auditorium or laboratory situation. This latter application shows great promise for speeding up laboratory instruction and cutting down on accidents and damage to apparatus.

Other uses—A number of other uses are being developed for closed-circuit television systems on campuses or in school systems, including:

1. The remote observation of teaching.
2. Distribution of films to classrooms from a central point.
3. Training of students in television techniques or in teaching via television.
4. Presentation of special lectures to overflow audiences in other rooms, or in the community via a community distribution system.
5. Televising instruction or special programs into residence halls.
6. Research on instructional methods.
7. Recording instructional presentations for re-use or evaluation, by means of kinescopes or videotapes.

RELEVANCE OF NETWORKS TO CLOSED-CIRCUIT TELEVISION

With the demonstrated efficacy of television in bringing high-quality instruction to large numbers of students, it is not surprising that much thought is being given to the development of methods of extending the reach of good teachers over larger and larger areas, and to the use of multiple channels in order that a number of different courses can be offered simultaneously. Therefore, at this point it might be helpful to consider some of the possibilities of networks for closed-circuit television on several different levels—local, community, state-wide, and for larger regions. In doing this I shall refer to plans or possible developments at Pennsylvania State University to illustrate the several applications of networks to CCTV operations.

Local Networks—Let us consider local networks first. These are defined as covering a campus or cluster of school buildings. The interconnection of buildings on a campus by means of closed-circuit television has several possibilities which are of immediate interest to us at Penn State, and to other institutions facing similar problems. First we would like to be able to move instruction to students, rather than students to instruction. As campuses grow in size, the problem of student movement between buildings becomes tremendous.

A second use of a campus TV network would be to connect residence halls with the closed-circuit systems so that instructional or other suitable programs can be fed into dormitories. It seems highly inefficient, in the face of present student enrollments, to have a set of dormitory buildings which remain empty for most of the day. Lounges or even dining rooms could be used as instructional centers. We have developed a plan at Penn State for a campus-wide closed-circuit network, and need only $25,000 to implement the first phase of it. This would connect the lounges of all residence halls with the university's two main closed-circuit TV systems.

Community-wide CCTV Networks—A community-wide network is defined as one which covers a town or city. It is natural that several public schools in a city might wish to share their best teachers in certain subject areas. This they can do if the several schools are linked by a television cable system. Such a system permits a number of different lessons to be made available at the same time. This arrangement is, as I understand it, the plan to be used in Corning, New York.

Similarly, a university may have buildings located in different parts of a city and may wish to interconnect them to reduce student travel between them.

At Penn State we have been interested in extending the university into the community, and have accordingly made connections between the university's closed-circuit systems, and the community cable system which serves about 1,000 families in State College. Each semester the university puts several courses and occasional special lectures on the cable system. In a similar way, several colleges in a community might share their faculties with a resulting benefit in both instruction and economy to all concerned.

County-wide and State-wide Closed-Circuit Television Networks—There are instances where the schools in a county may wish to share teaching resources and their best teachers. In order to accomplish this objective, the schools may be linked by a closed-circuit cable network. The most outstanding example of this arrangement is in Washington County, Maryland.

Similarly, a university with several branches in a state may wish to link the branches with the central campus in order to make superior resources available to all. For example, Pennsylvania State University has fifteen campuses or centers located in various parts of the Commonwealth of Pennsylvania.

Serious study is being given to find feasible methods of linking these campuses to the main campus at University Park. It would probably be economically feasible to link the three or four branches within a distance of a hundred miles of the main campus by means of microwave links. In order to investigate the administrative, educational, and economic feasibility of such a plan, Penn State is in the process of making application to the FCC for permission to operate a microwave connection between the main campus and the Altoona campus forty miles distant.

Until recently it was not possible, under FCC regulations, for a university to own and operate microwave links for closed-circuit purposes. We understand that there has been a recent ruling that makes this operation a possibility, but that the microwave links will have to operate above 10,000 megacycles. As yet, equipment is not available to operate in this band.

There is a real question as to whether such a microwave network to reach all fifteen of our campuses would be economically feasible.

It is also probably not at present feasible either economically or in terms of engineering requirements to use videotape for such a purpose. It is our hope that reliable videotape equipment moderate in costs, (compatible cost-wise with vidicon cameras), will be developed in the next two or three years, to make such a tape network a practical possibility.

Regional Closed-Circuit Networks—The availability of moderately priced reliable videotape machines would, of course, make possible the exchange of high-quality teaching among closed-circuit installations on a regional, national, or international basis.

Similarly, instruction originating on a closed-circuit system can be fed into a broadcast television network, and thereby receive wide distribution. Such a prospect has tremendous potentialities for the future of education at all levels.

Session VI

STATUS REPORT

Close-up: Ohio

Mr. Richard B. Hull

Director
Radio and Television Broadcasting
Ohio State University

Ohio, like many other states, has thought about a television network for some time. In 1951 and 1952 designs were drawn up for a state network and efforts were made to pass it through the Ohio legislature. At that time apparently two things prevented its consummation. One was that the legislative service commission in the state felt the whole thing was "blue sky." In other words, the idea of television as an adult informational and cultural sort of service, with enrichment courses for out-of-school children and children in the classrooms and students on campuses, wasn't vivid enough. Television hadn't been thought of as a teaching device at that point.

Another factor which contributed to the effort to get legislative support was the fact that the effort was spearheaded by the state universities, of which there are five in Ohio, plus one state-supported college. The five universities to which I refer are Miami University at Oxford, Ohio University at Athens, Ohio State University at Columbus, Bowling Green State University at Bowling Green, and Kent State University just north of Akron.

There were substantial developments in other parts of the state, notably Cincinnati, which had the first educational television station in the state on the air. This was a community station. There were community efforts taking place in Cleveland, some emerging in Toledo, and in Dayton. And the statement of critics of other than myself was that failure to embrace these other agencies was a little bit stupid politically.

The state universities were conceived as a selfish phalanx. In 1957 there was formed the Ohio Council on Educational Television, whose membership was modeled on the Ohio Inter-University Council.

This created a pattern of membership whereby anybody in a reserved channel area who had applied for a station or who was operating a station or constructing a station could become a member. The membership was dual. So, depending on the administrative structure of a given institution—a community, a corporation, a public school or a university—the executive officer of that agency and the operating manager of the station were co-members on this council. Dues were $100 a year.

The effort was to be one of self-help. The growing interest in a network in Ohio derived in part from the fact that every educational assignment is UHF, so everybody shares the same pain or predicted pain. At the same time, in Ohio on the whole, the situation may be helped by the fact that no new commercial allocations, unless the Commission changes its mind, will be anything but UHF. All the V's have been taken.

The map illustrates the coverage area of WOSU at Ohio State University in Columbus and that of the other four colleges. The network link with the four quadrants was a schematic drawn up by the Sarkes Tarzian firm.

This envisioned the normal microwave circuits which would be combined with videotape recording. The idea was to use Columbus, the capital and central point of the state, as a network switching center, and memory storage unit.

Regardless of whether this was instructional or general broadcast material, we would have access to the four quandrants of the state in the intervening stations and we would have access to other adjacent state networks. Pittsburgh is just a bit to the east; Toledo and Detroit are near-by; and we are close to Indiana, and so on.

This was the general plan at the outset. Its major motivation came from the fact that everybody in the state was impoverished, and it was thought we could share production costs by operating as a group. As a council we could have one consulting engineer for all the agencies. There could be one stockpile of equipment, and so on. Economics was the chief motivation.

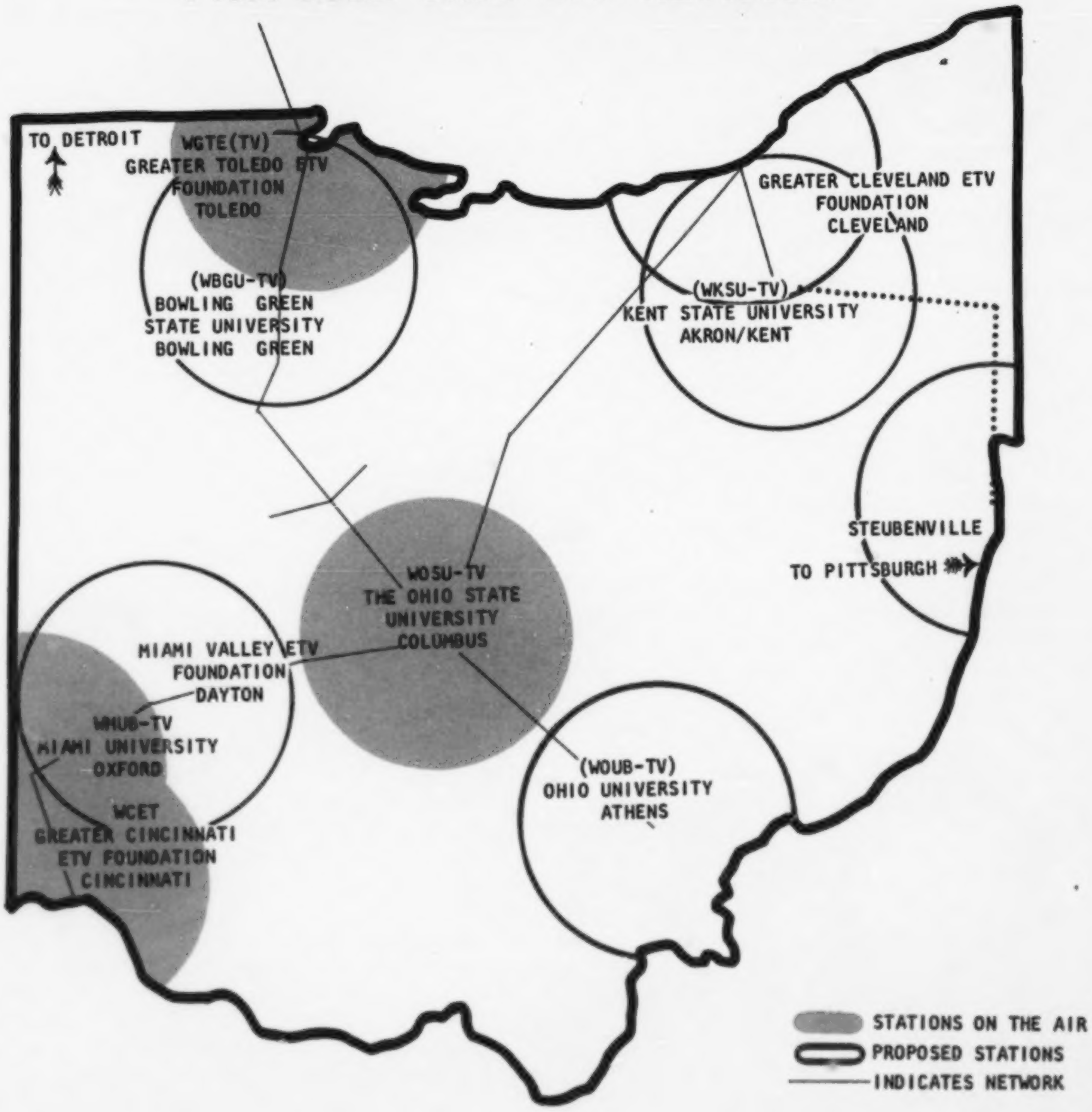
The next major step was when Governor O'Neil, the governor before the last election, appointed a commission on higher education, headed by the president of Ohio University in Athens. This group included public and private colleges and also some lay people. The idea was to look at Ohio's total future problem in terms of educational implications, numbers, cost, quality, and all the rest.

One of the plans then submitted to this commission at its request was essentially a plan to create a quality floor on the junior college level for higher education, and it was based on two or three assumptions: that there would be many more students, everything would cost more, and if conventional methods were followed, financing would not follow in proportion; that there would be competition for skilled instructors on the university level, not only from other universities, but from business, government, and industry, and maybe we would have to pay a teacher a commercially competitive salary in order to keep him in the physical sciences and other subject-matter areas. It was thought then that if we could establish a quality floor, so to speak, and assemble a faculty of thirty or forty people from all the schools in Ohio of the highest caliber possible, a television faculty; and then give such portions of the junior college curriculum as might lend themselves readily to television presentation; and then allow each student to register at the institution of his choice, presumably the one nearest his home—then we would begin to solve part of that numbers and quality problem.

Now, this was not thought to be a total answer. The student would often be on campus, as Father Steiner said this morning. We did not intend to go beyond the junior college level, except in special cases.

So the problem then became one of total interconnection. At the same time the governor's commission recommended this as probably the single most important element, economically, in helping Ohio's future.

PROPOSED OHIO ETV NETWORK


TO DETROIT
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GREATER CLEVELAND ETV
FOUNDATION
CLEVELAND
(WKSU-TV)
KENT STATE UNIVERSITY
AKRON/KENT
STEUBENVILLE
TO PITTSBURGH
WOSU-TV
THE OHIO STATE
UNIVERSITY
COLUMBUS
MIAMI VALLEY ETV
FOUNDATION
DAYTON
WMUB-TV
MIAMI UNIVERSITY
OXFORD
WCET
GREATER CINCINNATI
ETV FOUNDATION
CINCINNATI
(WOUB-TV)
OHIO UNIVERSITY
ATHENS
STATIONS ON THE AIR
PROPOSED STATIONS
INDICATES NETWORK

Network connections for operating and proposed ETV stations on reserved channels. Stations equipped with video tape recorders will use WOSU-TV as four-way switching center. Drop-in channels for total state coverage not shown.

At the same time the public school complex, the state Department of Education, and the Ohio council began to talk, and the school people became interested in sharing the lack of wealth in the state network in ways which are common to all of you in other states. A subject such as Ohio history and constitution, a required course where no good textbook existed, is one illustration. There it was felt television might be used.

It was felt that driver training might be presented. Driver training is something that irritates some principals and superintendents. But it is a vital factor in our state in terms of parents and insurance rates and safety experts in the automobile field.

Presented by television, this kind of material would be taken outside the core curriculum and would not bother the bell schedule.

These are examples of what we hope to use the installation for. In the rural areas our problem is akin to that of Nebraska. We have many, many places where physics is not offered or is offered only in alternate years, where chemistry is not offered at all, and likewise trigonometry and the rest. When it is offered, the quality of instruction is sometimes questionable. So the choice here would be whether there is instruction or no instruction, and by television we could offer quality instruction.

Now again the idea behind this was not that any of this would be superimposed on school systems. They could tap it if they chose to do so. It was envisioned that RCA and Ampex tape would be used to store lessons. They might be transmitted from midnight to eight o'clock in the morning for lessons during the following day. A given school could take it off on its own tape machines, or a station could, and would repeat them according to the local bell schedule or necessity.

On the air or under construction are four stations—Cincinnati, Columbus, Miami University at Oxford, and Toledo, a community station. Station activity is under way in other places where they have studios and equipment, but they are short a transmitter. Athens will be on the air next year, they believe. This still doesn't cover the whole state.

There is also a presumed design which would have repeater fill-ins. We were fortunate to secure successful passage of a study bill this year for $60,000, which will appoint a nine-member interim commission, not to study the feasibility of television networking, but to work out the engineering design and, even more importantly, to work out the relationships and the articulations, particularly between the several levels of education. That is about our status in Ohio.

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Session VI

STATUS REPORT

Multiple-Channel Educational Television

Mr. Philip Coombs
Secretary and Director of Research
Fund for the Advancement of Education

I gather that two things are in order here today. One of the things in order here is to dream about the future of educational television, even to dream wildly. The dream I am going to sketch out is still a very tentative, speculative thing. It may turn out to be only an idea that was attractive, but which stimulated people to think more broadly and boldly about the future of educational television.

In the work which we have been privileged to do in our organization with a good many school systems and colleges and universities in the field of instructional television, it seems to us that there is a wide consensus on a few basic points as of now.

The first point is that instructional television, wisely and properly used, and used in a sense of excellence, really works in terms of inducing good learning results, good educational experiences for the students and for the teachers concerned.

We clearly have a great deal yet to learn on how to make the best use of this new string to our bow.

A second element of consensus, we think, is that those who have worked in a variety of media in visual aids would agree that a diversity is desirable here, that it does no good to latch onto any one medium, such as film or open-circuit or closed-circuit television and say, "This is the answer." It is some optimum combination of these that we are seeking.

The third point (and the one that leads to the dream) is that with a single channel available to a twelve-grade school system, (and I will talk primarily at the school level here), it is clear that there are certain bottlenecks to the optimum application of television for instruction in the schools.

The first of these bottlenecks is that a high proportion of the youngsters around the nation do not have access today to instructional television simply because there are not enough ETV stations yet, and it is primarily the students in the metropolitan areas who have this advantage.

The second bottleneck is that even where there is a channel available, it doesn't go very far in enriching, in improving the total curriculum of a twelve-grade school system. This is a matter of simple arithmetic. The typical school system would have from 75 to 150 separate courses in the twelve grades, some of these broken down into specialized sections; but with a single channel available working full time on a six-hour school day, you would only have twelve half-hour instructional units against that curriculum which is at least ten times as large.

Therefore there is need for multiple-channel availability if television is to get its fullest reasonable utilization in the schools.

A third bottleneck is an economic one. You can obviously overcome the second one, the single-channel time limitation by going to coaxial cable, as was done in Hagerstown, but, as was demonstrated in Hagerstown, as soon as you move outside the heavily populated portion of your school district and get out into the more rural schools, (which need television most), your coaxial cable costs go up very rapidly on a per-pupil basis, and therefore you hit an economic bottleneck.

It was in the search for ways of overcoming this combination of bottlenecks that we came to the notion of airborne instructional television.

Here let me give you in very brief terms the general concept. The general concept is that you would assemble at an appropriate place—and possibly this would be a good university campus, where you would have all kinds of facilities, personnel, and resources available—the finest faculty that you could put together of experienced people who were masters of their subject, who could teach their subject well, who had enthusiasm for what they were teaching and perhaps who had had some real experience already in instructional television, although that wouldn't be essential.

And you would enable these teachers, under optimum conditions and with all the advisory help they could get, to develop a series of courses of the sort that the potential using schools felt they most needed.

Then you would have studios with tape recording and other facilities available and you would develop a series of full-length courses of the sort that the schools in the area believed they needed most. Then an aircraft would fly in a circle of about ten miles radius at 25,000 feet, and it would receive ground signals ultimately on perhaps six channels or maybe it is four channels—it is multiple in any event—in the UHF spectrum, and it would rebroadcast these programs over a large radius. In effect, the plane represents a very tall antenna.

Now, the schools on the receiving end would be in the same situation as are the schools now on the receiving end of television broadcasts, except that they would have multiple programs available, multiple channels. Parenthetically, local ETV stations, as they are equipped with videotape equipment would find it possible to take out of the air any program they chose, or which the local school system asked them to select, and record it for later play-back, either after school hours or the next day.

Obviously, the airborne system could not take care of many of the more local needs of the curriculum which would remain for the local stations to handle, in so far as television was the best way to handle them.

The area which the engineers believe could be served by such a system would have a radius, depending upon the power of the transmitters aloft, ranging somewhere between 150 and 200 miles.

Now, let me come to the economics of this. If you put a point down anywhere in the United States and draw a circle of 150 to 200 miles in radius, and then analyze the educational content of that area in terms of the number of schools, number of students, total expenditures currently on education there, you will find that wherever you put the point, there is an astonishing number of youngsters, even if you put the point out between North and South Dakota or in Nebraska. If you put the point in the Northeast so you sweep in the whole New York area, as I recall you get something over 8 million children in public schools within a 200-mile radius.

If you take a median point, say in the Midwest, and if you center roughly around the northern part of Indiana and draw a circle with a 200-mile radius, you include 5.1 million youngsters in the public schools.

Of course, you include a great many students in colleges and universities and in private schools as well.

Of the 5.1 million in that particular circle, 1,640,000 are in school systems that are significantly smaller than those which Dr. Conant's report suggests are too small to provide an adequate curriculum and an adequate quality.

I know that that conclusion of his has been challenged. But the point is, there is quite a different situation economically between the small school system and the large one in terms of the ability to provide a full and good-quality curriculum.

More than a third of the content of that circle (and this would be true almost anywhere you drew the circle) are small schools that today are having a terrible struggle to round out the curriculum even to include the most essential subjects, and certainly they are having a great struggle to secure and maintain a faculty competent to teach that curriculum well.

The basic theory behind this system would be that, if you drew a circle which would include Chicago and Detroit, Madison and Milwaukee to the north, Louisville to the south, and Columbus, this would provide an opportunity for public school systems within that area to share the finest teaching talents they together possess.

So if, for example, (as happens to be the case), there is a rare and unusual high school English teacher in Detroit on television right now—rather than limiting that teacher's ability and access to the youngsters in Detroit, the Chicago youngsters can get something from Detroit through this system.

There happens to be in Milwaukee (I have forgotten what he teaches now) an outstanding television teacher, who can serve more students than those in Milwaukee. But there are other potentialities in such a system. We have talked with quite a few educational leaders in the Midwest about this to get their reactions as to its educational feasibility and desirability. Those responsible for teacher training have been especially enthusiastic. They have pointed out, for example, that in the ordinary course of teacher training it isn't possible for a student teacher to see enough good examples of excellent teaching, and here would be a skyful of good examples.

They have pointed out also that the whole communications system within the educational profession by which people in local school systems learn about the fresh thinking and the fresh ideas and new developments in other local school systems is a quite inadequate communications system today.

News—professional news—doesn't spread fast enough, and here you could have a means by which, say, one afternoon a week for an hour, you could communicate with the teachers and principals all through a large area, so they could talk to one another.

If there is an exciting new development on some educational problem in Indianapolis, it can be learned about rapidly in Madison, Wisconsin. So you can use this for professional advancement and for helping a kind of bootstrap operation at the local school level all across a large area.

What about the economic feasibility of such a system? It was precisely that question that led us to explore or to begin exploring this airborne idea. Our calculations, based on detailed ones which engineers have given us and allowing a substantial amount for educational costs, (which are premised on very high salaries for the teachers involved), suggest that — once you got through the experimental period of the first two years, say, and shook out all the bugs in the techniques, and if you had a wide utilization of these services by the public schools concerned—it should be possible to arrive at an annual cost per pupil for the entire airborne curriculum (which might include 50 to 70 courses) somewhere in the order of magnitude of $5 a year per student for the full production and distribution costs, but not including the local-school reception cost. It does not include the cost of the receiving sets, but it would include everything up to that.

As I say, these are dream figures, and I underscore that.

Maybe this cannot be done. There are all kinds of problems. We are exploring these problems with the most competent educators and engineers that we can lay hands on.

Let me just cite a few of the problems that would quickly come to your mind and suggest how they are being explored. First is the question of technical feasibility. What do you do on a bad day? Can the plane take off? Or if it takes off, can it land?

This question is being explored with Air Force personnel on the basis of their early-warning-system experience, where they fly planes on station for much longer hours than we are talking about. We are exploring it with the General Dynamics Aeronautical Corporation. We are exploring it with others familiar with aircraft operation. And the indications thus far are that this is a clearly soluble problem, that you probably wouldn't have to shut down school any oftener because of aircraft failure in this system than the schools are now shut down due to snow in the winter, and perhaps less often than that.

There are other questions of technical feasibility as to whether you can get a good signal through, and whether it is a reliable signal.

The Boulder Laboratories of the National Bureau of Standards which has years of research experience in propagation studies is now engaged in a series of research studies that will give us some quite good indications on the reliable area of reception that can be anticipated, taking into account weather conditions, terrain, and the like.

Here again the initial indications are encouraging. The really tough question you would raise is: How are you going to get all those channels allocated to you? And maybe you can do it in one area, but suppose it succeeded there, and some other areas wanted the same kind of service, what would be the national requirements?

This is probably the toughest question of all. It is ironic that everybody has been unhappy about the UHF channels sitting around unused, but when you propose to use them (and we are talking about the upper half of the UHF spectrum) you begin to create some tough questions.

This would create an enormous requirement all across the country ultimately for the utilization of UHF channels, such an enormous requirement that we have given attention to possible techniques for economizing on channel space.

We have some very able engineers working, for example, on the exploration of a narrow-band type of signal, with receiving equipment such that it would compensate for any loss of signal quality that would otherwise be involved by dropping from a broad band of 6 megacycles to a narrow band of 3.

This has been tested in the laboratories already before a jury of educators, to see whether the narrow band does as effective a job in communicating educational information as the conventional method. In the laboratory the unanimous conclusion of the jury was that the narrow-band technique with the special receiving equipment was at least as effective as the conventional system and in certain respects more effective for educational purposes. We don't know how it will work out in the open and out of the laboratory.

As I already suggested, the cost questions are being explored and the tentative very rough estimates there suggest that, although the lump-sum costs of such an operation would be large indeed, they would be small relative to the annual budget, say, of the Chicago school system, or the Detroit system, very small indeed compared to the total costs currently of the schools in the areas served; if you added them on top of the existing current costs, they would represent far less than 1 per cent.

But for that 1-per-cent increment in costs, if you could achieve a very considerable boost in potential quality of learning in the schools, this could be a technological breakthrough in education without which I suspect we cannot hope to get a very widespread and rapid increase in the quality and the breadth and the depth of educational offerings.

One final question some of you may ask: If you had such a system as this, what would be the impact on existing ETV stations? This question has been discussed at considerable length. Those involved in the explorations include experienced ETV station directors. The unanimous feeling of those who have worked on this idea is that here is an opportunity for collaboration between two different sets of broadcasting instruments.

There are many possibilities of fruitful collaboration between an airborne system and local ETV stations, particularly now that the stations are becoming equipped with videotape. There is no reason, for example, why a local station cannot develop whole courses on tape for rebroadcast on a system basis. There is no reason why they couldn't, as I suggested earlier, take programs from the system for re-use locally. And you can think through many other ways in which an effective and fruitful partnership could be formed between local stations and the airborne system, to the benefit of both.

Well, I close again with my initial caveat. This is a dream. Yet if our explorations of the many different angles of it continue to yield as promising results as they have to date, it may not at some time in the foreseeable future prove to be so wild a dream.

Session VI

STATUS REPORT

Discussion Following Formal Presentations

MR. BOUWSMA: We have a UHF station in Detroit. If we pick up and rebroadcast programs from your station, would we have to rebroadcast the signal you are sending out, or convert and put on our regular UHF signal?

MR COOMBS: Under present technology, if this experiment were to be launched with only narrow-band broadcasts, you would need to have some type of converter to translate the signal from a narrow band to a broad band, either at the point where you recorded it or where you replayed it.

However, the thinking at this moment, always subject to change as the technicians think further, is that, if you were to launch such an experiment, you would launch it initially with both conventional and narrow-band UHF broadcasts.

This would be for two reasons. One is so that educators and the public would have an opportunity over a wide area to observe and decide for themselves whether and how they could best use this, and also to give the UHF stations a chance to find their roles in this. The second reason is a technical reason that there are certain technical questions that need to be tested in practice, which would involve broad band as well as narrow band. Obviously, there is no advantage in using narrow band from education's point of view. The advantage is from the FCC's point of view. It breaks their bottleneck of a limited spectrum so that, if you put a foot in both those doors in the initial experiment, you test out both methods.

We are assured it will be technically feasible to develop converters to go from one set of standards to the other, but we don't have those converters right now.

Session VII

COSTS

Lawrence Frymire, Chairman

Session VII

COSTS

Presentation by

Mr. Hartford N. Gunn, Jr.

General Manager
Stations WGBH-FM-TV
Lowell Institute Cooperative Broadcasting Council

Of all the things we have talked about over the last two days, the subject of costs is probably the most difficult to say something about that will be useful and applicable in every situation. There is no such thing as a "standard" cost for state or regional network operation.

I think those of us who have worked in this area, particularly if we have ever been responsible for the construction of educational radio or television stations, know there are no standard costs in the construction of stations, either. While it is true that the cost of a microwave link, a television or radio receiver, antenna, and similar pieces of network equipment is approximately the same no matter where you are, the total system involved in each state or regional network is a matter of custom design; therefore, it is almost impossible to arrive at standard cost data to fit every situation. The total cost of a network depends, among other things, upon the type and design of system selected, the number of equipment units required, and availability of surplus equipment, power, buildings, land, personnel, and other facilities and services at little or no cost.

In many areas we can find such things as equipment, buildings, and land that can be furnished to us for a very small cost—in many instances at no cost at all—and this means that cost data which anyone might provide you would more likely be misleading than anything else, although a little later on I'd like to give you some examples of the type of costs that we have run into in setting up our network.

I feel that it may be more helpful to outline first some of the factors or cost considerations that go into the design and operation of a network. This list of cost factors is not an exhaustive one, but I hope you will find that it suggests some areas for discussion. There seem to me to be three basic cost areas: development, equipment and installation, and operation.

In the area of developmental costs, one of the major items is administrative expense. A large part of the administrative expense in developing a network goes into the executive time required to get the project started and planning under way. In most organizations this probably will not be an out-of-pocket expense, but rather it will be absorbed by the organization. This is a euphemism in the accounting world, for "The boss will work overtime at no increase in salary." Nevertheless, it is well to consider the requirements for executive time in your planning because if you are going to administer the development and establishment of the network, you must plan on using not only much of your spare time, but also time diverted from your regular duties. This may mean that certain of your activities will have to be transferred elsewhere or temporarily set aside.

As you look further into the cost of development, you will find that many direct out-of-pocket expenses such as long-distance telephone and telegraph, travel and conference costs, come very quickly to the fore. A large part of your time will be spent in visiting and talking to interested people across the state or region. These conferences should help you to determine the objectives and scope of the network. Answers must be found to such questions as: What is the purpose of the network? What is to be its coverage? Where are programs to originate? Such information is essential if costs are to be controlled.

If the planning has been carefully done, it should provide intelligent and useful information for the next phase of developmental activity—engineering and legal surveys. If you have an engineer on your staff, or an engineer available from a local station who is familiar with the problem of network systems, you may want to bring him in for a thorough discussion of the project. Otherwise, I would recommend that one of the most economical expenditures you can make in the long run is the hiring of a first-rate consulting engineer. The cost will depend upon the amount of his time required, as well as his expenses for travel, drafting work, map making, etc. There is no question but that a man with thorough engineering knowledge of network systems can save you more money than his fee. Even if your own engineers do all or most of the work, it is helpful to have their calculations reviewed by a consulting engineer, particularly with regard to matters involving the FCC and frequency allocations.

At the appropriate time you will also need competent legal advice concerning such matters as the acquisition of land, buildings, rights of way, etc., as well as advice in connection with applications to the FCC for broadcast facilities that may be needed.

One of the most valuable services performed by the engineers and lawyers will be their assistance in helping you to determine the total cost of the network system. It will be necessary to decide what type of system will be used: telephone company facilities, your own microwave setup, off-the-air rebroadcast from existing or new stations, videotape and/or audiotape recording and distribution, or possibly one of the new methods such as scatter transmission, Stratovision, earth satellite. Other decisions to be made are the exact route of the network, the amount of money available, whether it is to be a one-way or two-way system, origination and non-origination points, attended or unattended technical operation, one-channel or multi-channel transmission, and so forth. It should be possible with this information and the assistance of your legal and engineering consultants to establish a detailed budget for the project. A budget is an extremely valuable tool in controlling costs.

After this developmental work, the next major cost item is equipment and installation. In some cases this will be a very nominal expense, particularly if it is to be an off-the-air radio relay network and/or can be done with existing equipment. In other cases the equipment required will be extremely elaborate and complex with an appropriate price tag. Then, too, you may have to acquire land, put up buildings, provide power, and such.

The third major area of expense is incurred in the actual operation of the network. First are technical expenses—such as personnel, power, tubes and parts—connected with the operation, maintenance, and replacement of equipment. Second are costs stemming from coordination and administration, including travel, personnel, and telephone and telegraph. If the number of programs exchanged, the number of originating stations, and the complexity of the programing is too great an administrative load for the existing staffs of the participating stations, then the network must employ its own staff—beginning first with a traffic manager, then adding a program manager, chief engineer, general manager, and secretarial assistance. I am sure that Raymond Hurlbert can tell you more about the costs involved in the operation of a central office. This can become a major and yet necessary expense.

As the network grows, program expenses may increase as well. Although a cooperative network in which a number of stations contribute programing should mean lower program costs per station, there may be a tendency toward larger, more elaborate and more costly productions. Also, there may be certain out-of-pocket expenses for additional fees which become mandatory when special talent, copyrighted materials, etc., are broadcast over more than one station.

Having reviewed the establishment of our four-station off-the-air FM radio network in New England, we found that our developmental costs were approximately $3,000. Most of this sum was spent on engineering surveys to find FM frequencies that would permit off-the-air relay without interference. The remainder was for travel and conferences with executives of the other stations to plan and establish the network. Over and above the $3,000 for development, endless man-hours of executive time were devoted to the project. In many cases other station activities had to be curtailed so that more time could be made available to build the network. Approximately $1,500 was spent on equipment and installation. This went mainly for the purchase of first-class FM receivers and high-gain all-weather antennas.

Because this is an off-the-air radio relay network, the operating costs are extremely low. Equipment operation expenses are, in fact, virtually negligible—probably less than $200 per year. The coordinating costs, excluding the time of regular station personnel involved in network administration, probably does not exceed $1,000 per year. Because of the size and simplicity of the network, there are no full-time personnel employed in its operation.

While our program costs as the principal network originating station went up several hundred dollars over our regular budget, the other network stations, which relied heavily on our programs, enjoyed an effective saving of approximately $50,000 over what they would have spent if they operated with the same programing on an independent basis.

Our experience with the two-station New England Educational Television Network using off-the-air relay is quite similar to that of our radio network. Developmental cost ran several hundred dollars, equipment and installation approximately $2,000, equipment operation less than $300, coordinating costs approximately $1,000 per year, and program costs roughly the same as the radio network.

This will give you some idea of what limited off-the-air networks involve in terms of cost. Unfortunately, such networks are not feasible in many areas because of the great distances and areas involved or the lack of properly located educational stations.

There are some rules of thumb or generalizations which I have found helpful. In closing I pass them along in the hope that they may be useful to you in establishing and controlling network costs:

1. Do not accept someone else's cost data, but rather, benefitting from their mistakes and observations, make a complete study of your needs and establish costs to fit your own network design.

2. Think through very carefully the objectives of your network. Ask yourself such questions as: Is instantaneous transmission required or desirable? What area do we want to serve? What area must we serve to be effective and to enjoy adequate support?

3. Prepare a detailed budget as soon as possible and use it to control costs. Do not put it underneath the blotter or slide it in the drawer and forget about it until you're in trouble.

4. Seek and use experienced and competent technical and legal help and advice.

5. To the maximum extent possible, draw upon existing resources such as state land, surplus equipment, personnel from your own station and/or from commercial stations where appropriate.

6. Consider executive time when computing costs.

7. Consider and weigh carefully alternate methods and systems of networking. While you may have in mind, when you start, a particular system which you think is ideal, it's extremely helpful—if for no other reason than that I feel it helps to advance your argument to the legislature or groups you must go to for your financing—if you have considered the other ways, the other methods of networking, even if you decide in the long run that they are not practicable for your particular operation.

8. Provide adequate time and staff for proper coordination of the network.

9. Consider the impact of the network on your own programing, costs, schedules, personnel, etc. Be sure you know what it is going to do to your own operation before you embark on an extensive network undertaking.

10. Utilize the benefits of a network to the fullest extent, taking advantage of the new and better programs, the additional programs, and the greater publicity and coverage made possible by networking.

11. Think long range. Plan and design your network with the idea of future interconnection with adjacent states and regions. This will minimize problems in the future and maximize the rewards and benefits of network operation.

Session VII

COSTS

Presentation by

Mr. John Klindworth

President
K & M Electronics Company, Minneapolis

My firm has been employed by KTCA-TV to make an engineering study of a microwave system for the NAEB, Region 4. The purpose of this study is to provide information as to the feasibility and best method of constructing and operating a microwave system in Region 4 and a tie-in to other regions.

This study was approached on the basis of using present state-of-the-art equipment and standards, and thus giving a system that could economically be built today if desired. The limitations of the system are under consideration, realizing that research can only improve any present-day equipment capabilities. The capital equipment and operating cost figures presented by this study can be of valuable use to all of us so we have tried to break them down for application to any area.

Figure 1 shows five of the six states in Region 4, as well as Wisconsin which is our other region tie-in. Wyoming is not shown or actively included at this time due to its remoteness and sparse population. The microwave loop interconnects only the VHF channel assignments, which are shown with their appropriate coverages, mainly because the UHF allocations, as at Omaha and some of the other places, are pretty well duplicated and fall within the VHF coverage.

We have the very unique situation, when looking at this area, that by taking the VHF stations we can go around in a circle and have a loop by tying in to Wisconsin for another region. In studying this, this loop idea gave us a very good means of having a two-way system with extra reliability in case of outages. We can originate in Minneapolis and start around the loop both ways. In Lincoln, Nebraska, a picture will come into the network from both directions and either one can be used in case there are outages or trouble along one of the net paths.

We have branch links running up to Duluth, which is a two-way system because we have an originating educational unit in Duluth, and we have a branch leg going on down to Grand Forks for the University of North Dakota. Way up north we have one off-the-air single-direction pickup which is feeding Minot.

The regional tie-in to Madison and to Milwaukee can feed both directions into the loop simultaneously, again allowing anybody on the loop to take whichever picture is doing the best for him. He has a choice. By the two-way system we can operate net programs on the system and still use a return path for feeding local regional information that can be recorded on videotape so that both directions are operating simultaneously in this system.

Laramie, Wyoming, was not considered and included in this because of its remoteness, and it would probably be operating from Denver, which it is adjacent to.

One other factor. In addition to a two-way system direct connected all the way through, each leg, as from Minneapolis out to Appleton, has provisions for off-the-air pickup automatically in case anything happens to the two first sections of the hop.

There will be an off-the-air receiver that will feed the information from Channel 2 in Minneapolis over the microwave system and continue it on its way. This is true on all the legs. The return leg from Appleton to St. Paul has an off-the-air pickup at its second hop that would be automatically switched over in case of loss of the signal coming from the first two hops. So every leg in this whole system is provided with automatic changeover to off-the-air pickup on the first hop, which cuts down the number of outages and gives us a stand-by provision.

We made one field trip to Williston, North Dakota, which was of interest. Williston takes its signals from Minneapolis on an off-the-air pickup through seven hops of TD-2 telephone equipment, one hop of Motorola into Fargo, off-the-air to Fargo, through four hops STL Motorola equipment to Bismarck, directly out of Bismarck directly connected through seven hops to Williston, eighteen in all.

From this we were quite enthused as to the quality that was obtained and what could be done with their one comment that it was much better when they used to have direct pickup out of Minneapolis instead of over the air. They went to an economy situation out of Minneapolis.

It is important that we consider the VHF station cost, as many of these are not built as indicated by the dotted coverage lines. Yet, they are essential for a successful educational regional network, as well as being physically a part of the microwave study by use of the transmitting tower as one of the microwave towers. While this is a cost factor of this sytem and is not included as part of the equipment cost, it should not alter our system cost study, as *each microwave system will probably have similar station terminals*.

The microwave-system cost can be further qualified by a schedule of equipment as we have arranged it for computing the total cost of the system. Remember this is a double system.

Reviewing the microwave equipment schedules, the equipment lists (Figure 3) are grouped into the equipment common per hop, the equipment common for each intermediate tower site, and terminal equipment. The equipment per hop includes the dual microwave units with both a transmitter and receiver operating from a common parabolic antenna.

The site equipment includes the tower, building, land and roads, as well as stand-by power facilities and test equipment.

The terminal equipment includes the equipment required on each leg, such as the alarm equipment, stand-by off-the-air receivers, sound channels, and stabilizing amplifiers.

Figure 1

Proposed Microwave System and

VHF Television Coverage

NAEB
Region IV

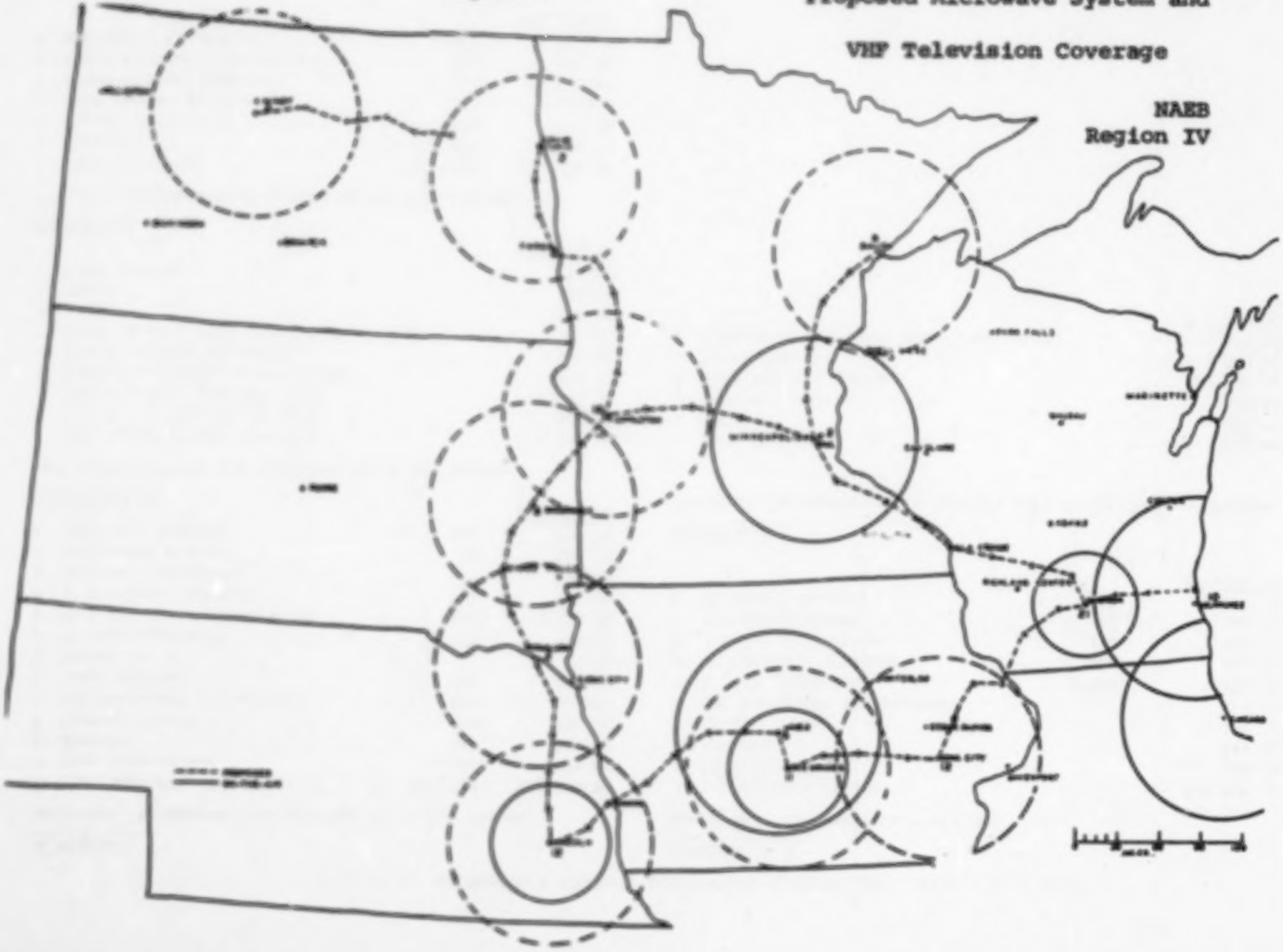

Figure 2 MICROWAVE SYSTEM EQUIPMENT SCHEDULES NAEB - Region IV

SCHEDULE E

Microwave Equipment Cost per Hop for 2-Way System

2	1.0 watt STL Microwave	$10,000.	$20,000.00
2	Data Transmitter	188.	376.00
2	Encoder	441.	882.00
2	Carrier Switch	150.	300.00
2	Set Waveguide Accessories	400.	800.00
2	Load Isolators	300.	600.00
1	Waveguide T		85.00
2	Waveguide Filters	275.	550.00
2	8' x 12' Passive Reflectors	545.	1,090.00
2	6' Parabolic Antenna	300.	600.00
2	Antenna Feed Horns	175.	350.00
2	Horizontal Mounts	60.	120.00
2	Parabolic Heaters	125.	250.00
			$26,003.00

SCHEDULE F

Intermediate Tower and Site Cost for 2-Way System

1	250' Guyed Tower, Installed	$ 5,500.00
1	8 x 10 x 8 Pre-fab Building	1,500.00
1	Site including land and roads	1,000.00
1	Automatic Standby Power System	1,700.00
1	3 KVA Voltage Regulator	430.00
1	Video Monitor with sound & demodulator	300.00
1	Scope	250.00
1	Meter	100.00
1	Rack Cabinet	75.00
		$10,855.00

SCHEDULE G

Terminal Equipment Cost on each leg for 2-Way System

2	Data Receivers	$ 210.	$ 420.00
2	Decoders	673.	1,346.00
2	Conrac Receivers	295.	590.00
2	VHF Antenna Systems	500.	1,000.00
2	Sound Channel Systems	1,200.	2,400.00
2	Sound Channel Transmitters	700.	1,400.00
2	Stabilizing Amplifiers	1,500.	3,000.00
			$10,156.00

SCHEDULE H

Single Unit Equipment Cost per Hop

1	1.0 watt Microwave		$10,000.00
1	Data Transmitter		188.00
1	Encoder		441.00
1	Carrier Switch		150.00
1	Set Waveguide Accessories		400.00
2	8' x 12' Reflectors	$ 545.	1,090.00
2	6' Parabolic Antennas	300.	600.00
2	Antenna Feed Horns	175.	350.00
2	Horizontal Mounts	60.	120.00
2	Parabolic Heaters	125.	250.00
			$13,589.00

SCHEDULE I

Terminal Equipment Cost on each leg for a Single-Direction System

1	Data Receiver	$ 210.00
1	Decoder	673.00
1	Conrac Receiver	295.00
1	VHF Antenna System	500.00
1	Sound Channel	1,200.00
1	Stabilizing Amplifier with Power Supply	1,500.00
		$ 4,378.00

Figure 3 MICROWAVE SYSTEM EQUIPMENT SCHEDULE SUMMARY NAEB - Region IV

Two-Way Simultaneous Operation

Basic Equipment per hop, Schedule E	$26,003.00
Fixed Cost per intermediate Tower, Schedule F	10,855.00
Terminal Equipment per leg, Schedule G	10,156.00

Single-Direction Operation

Basic Equipment per hop, Schedule H	13,589.00
Fixed Cost per intermediate Tower, Schedule F	10,855.00
Terminal Equipment per leg, Schedule I	4,378.00

Sample Computation for one Leg of System:

St. Paul to Appleton, 5-hop, 2-Way operation

5 x $26,003	$130,015.00
4 x 10,855	43,420.00
Terminal	10,156.00
TOTAL	$183,591.00

Figure 4 MICROWAVE SYSTEM EQUIPMENT COST NAEB - Region IV

Cost per Leg

Leg #	Location	# of Hops	Distance	Cost
1	St. Paul to Appleton	5	146	$ 183,591.00
2	Appleton to Brookings	3	78	111,875.00
3	Brookings to Vermillion	4	121	146,733.00
4	Vermillion to Lincoln	5	137	183,591.00
5	Lincoln to Ames	7	179	257,361.00
6	Ames to Des Moines	1	30	36,159.00
7	Des Moines to Iowa City	4	110	146,733.00
8	Iowa City to Madison	6	167	220,449.00
9	Madison to Milwaukee	3	75	111,875.00
10	Madison to St. Paul	8	246	294,165.00
11	St. Paul to Duluth	5	141	183,591.00
12	Appleton to Grand Forks	7	191	257,361.00
	2-Way System Totals	58	1621	$ 2,133,484.00
13	Grand Forks to Minot (Single Direction)	5	145	126,598.00
	Complete System Totals	63	1766	$ 2,260,082.00

Average Hop Distance - 28 miles

Figure 5 MICROWAVE SYSTEM ANNUAL OPERATING COST NAEB - Region IV

Power for the System at $.03/kwh	$ 44,938.00
Insurance at a cost of $.75/hundred of cost	16,646.00
Maintenance	
13 Maintenance Personnel at $5,000	65,000.00
1 Supervisor	7,000.00
Transportation and Travel	36,400.00
Equipment, building, tower, land and road Maintenance and upkeep at $1,000 per microwave unit	121,000.00
	290,984.00
Annual Depreciation Cost based on an equal rate over 10 years	226,008.00
TOTAL	$516,992.00

Figure 6 MICROWAVE SYSTEM EQUIPMENT AND OPERATING COST BREAKDOWN NAEB - Region IV

Equipment cost for Two-Way System

Total Hops - 58
Total Miles - 1621

Cost of System	$2,133,484.00
Additional Cost	86,010.00
Total	$2,219,494.00

$2,219,494./58 hops = $38,267/hop
2,219,494./1621 miles = $1,369/mile
2,219,494./116 units = $19,133/unit

Operating Cost for Two-Way System

Cost per Microwave Unit

$290,984/121 units	= $2,405/unit
Depreciation/unit	= 1,913/unit
Total	$4,318/unit

Cost Per Microwave Hop

$290,984/63 hops	= $4,604/hop
Depreciation/hop	= 3,827/hop
Total	$8,431/hop

Cost Per Mile

$290,984/1766 miles	= $164/mile
Depreciation/mile	= $137/mile
Total	$301/mile

Equipment Cost for Single-Direction System

Total Hops - 63
Total miles - 1766

Cost of System	$1,521,826.00
Additional Cost	86,010.00
Total	$1,607,836.00

$1,607,836/63 hops = $25,521/hop

$1,607,836/1766 miles = $910/mile

The equipment for a single-direction operation is also grouped for planning of multiple systems.

Our equipment grouping by schedules allows us to obtain our system cost for each leg of the system (Figure 3).

We have used as an example St. Paul to Appleton, which has five hops, a two-way operation. We have five times our equipment per hop, four times the equipment per intermediate tower, and we have terminal equipment.

Now, the total cost figures, $183,591 for the system, depend upon the VHF transmitting towers at the end. We are using them as part of the microwave system. However, almost any leg that you build is going to have such towers at the end, and it's not uncommon that they would automatically be there, but they are not included separately as a cost item; so for this system to work, it depends very much upon those VHF stations that we had shown being in operation.

On this cost schedule (Figure 4) it can be noted that we have 13 legs with 58 dual direction hops and five single hops, with a total of 1,766 miles at a cost of $2,260,082.

Now, this cost factor is based on present list prices, and there are going to be many variations, as you all know, in that. However, there are also going to be variations in this that can be adjusted accordingly. It does give you a starting point you can go from.

Our average hop distance is 28 miles. One factor that is very major there is that we are flat, very flat through this whole thing, with very minor elevations that we can depend on and use. This gives us an average distance on flat terrain of 28 miles, with a 250-foot tower system.

Now, this might be somewhat short, but this system is planned for Fresnel Zone clearances throughout the system for 7,000 or 2,000 megacycles, whichever is most desirable at the time we start building the thing.

Under operating cost (Figure 5) we find that power and insurance can be accurately determined. Other costs are estimates based on information available from experienced microwave operators other than AT&T. These costs do not include office or management personnel, as it is anticipated that much of the office requirements may be integrated with the television station, or may require separate program personnel for proper network scheduling as growth demands.

Under operating cost (Figure 5) we find that power and insurance can be accur-

We found some interesting information in talking to the boys who are running seven hops in Williston, Bismarck to Williston, and we have gotten some of this information from our own company in building transmitter systems, as far as our land, operating, power, and insurance costs.

A big problem in maintenance and time of maintenance is travel, particularly in a system like this. You go to one hop to find out what's wrong. You go to the second hop to see what's wrong. And you keep on legging it through the system. So travel and transportation are fairly high in here. They average about $50 a week per man for his expenses in travel.

Then maintenance on the building, tower, land, and roads is figured at $1,000 per microwave unit, of which there are 121 units in the system.

Depreciation costs are on a ten-year period over the whole system. This depreciation cost is on the total value of the system so it has a straight depreciation for building, roads, land, and everything in it, which wouldn't be depreciated quite properly in this case.

The depreciation is based on a straight ten-year plan, with equal depreciation each year, and is shown separately in case other depreciation schedules are desired.

Now that we have covered our total system cost, let's divide these costs so they can be used for your planning and estimates if desired. From our two-way system cost, we find that our equipment cost per hop is $38,267, per mile $1,369, and per unit $19,133. The operating cost is also broken down to give the cost per hop $8,431, per mile $301, per unit $4,318.

Due to economic reasons, many smaller systems will be single-direction hops, or extension of coverage by satellites may require single-direction systems, so we have also computed the cost of the complete system on a single-direction basis to determine an average cost. The single-direction cost per hop is $25,521, per mile $910. Single-direction operating cost has not been worked out for this system.

As a summary we would like to have you remember that there are many variables that may alter your microwave cost. I'm sure that area adjustments applied to our information can give you a formula for estimating your cost.

Session VII

COSTS

Presentation by

Mr. Raymond D. Hurlbert

General Manager
Alabama Educational Television Commission

I want to thank Hartford Gunn for making an over-all statement that is quite good, and the figures that we have just had presented are about as useable as anything I can imagine. However, in looking over the figures that we have just had, I decided immediately that we in Alabama couldn't have done what we did, had we used any of them.

We have been able to develop a network for a million dollars. That's the amount that the State of Alabama has put into our three-VHF-station, twelve-microwave-unit linking.

When I say twelve units, we started with six units that we bought from Station WSM, because it was compelled by law to use the common carrier when it was available, and we were able to get the six units for $100,000 installed with a certain number of towers. We have since added six units of our own, one way or another. They're all paid for, I mean. But we have now twelve units that are being maintained by means of an operation of three traveling engineers.

We take great pride in this, because we have practically no time off the air—that is, barring lightning storms and so on that are inevitable. In comparison with the operation that this very fine commercial station had when it used the six units and had to use four microwave engineers in maintaining those six units, we now have three engineers maintaining twelve units, traveling some four hundred miles.

When our good member of the panel here commented on chasing down trouble that you have in a network of microwave links, I knew whereof he spoke. However, we have a two-way radio system of communication for maintenance purposes, and our cars are equipped with this, as are our stations, and we can in most cases pin the problem down to a particular microwave unit.

Our staff engineers tell me that those automatic control systems are very fine, and every time they go to a microwave unit, the control system acts automatically when they cut the power. The generating unit cuts in immediately and perfectly. This works every time they go to one of those units, but not when the lightning kicks it out or some other system.

It has come to the point where I recently was advising that we put in another automatic unit, and I was told by the supervising microwave engineer that it would be nice to have, but he would consider it really an extra expense. And he was serious.

The administration of a network involves the latitude that you have. In Alabama, as I described briefly yesterday, we are operating under the law which instructs a state commission to take charge and operate educational television in the state. And it was my privilege as the first president of the commission to urge (and it was adopted) that the institutions that are now in charge of the programing be so designated. The authority has been delegated in such a way that programing is in the proper hands, and the pattern is so firmly set and established that I think that it will forever remain so.

The programing institutions make their own appeal to the State Legislature and receive their programing funds directly.

The network was recently evaluated by a former commercial operator and a very fine financial authority in our state. When he asked me how much the state had put into this operation—that is, into the establishment of this network—I told him it was approximately a million dollars. He said, "Well, it's worth ten million, and I know where you can get a customer."

I don't think he understood that we do not have the right of selling the FCC's allocations and so on. But I was pleased to have a hard, factual statement made as to what a commercial operator would consider this network worth in terms of dollars and cents.

Of course, I think he was thinking in terms of time on the air and the coverage, because you know our network not only serves our state to the degree of 78.8 per cent of the television homes. I tell people in those areas that cannot receive it, "If you have adequate equipment and tall enough masts, you can get it." And that is a statement of fact.

We also spill over into Georgia, Tennessee, Mississippi, and Florida. We can't help educating those areas but we're pleased to make a contribution!

We have in the administrative office of the state commission a staff including myself as general manager and consisting also of an office manager and a director of public information and program coordination.

The office of director of program coordination is for the purpose of knitting together in a package the type of programing that we have that goes out over all three stations simultaneously. It's necessary that we have a unifying effect. And it is working beautifully. The programing agencies are most cooperative. We're cooperative with each other throughout and have found that, except for minor problems of communication on occasion and other very minor matters, it is going extremely well.

I am pleased to state that we make a lineage report on our public information releases, and this last year we had 81,900 lines in publications, largely within the state, some few in the national picture.

I gave that information to our radio and television editor of the *Birmingham News*, which is the paper that covers a large part of the state, and he broke it down quickly and said that that was a total of 77 solid newspaper pages of information for the year.

Academic respectability is a matter of a gradual process there, and it has come about through a constant program from the very beginning in 1953, and as we now exist we are not only endorsed by the State Board of Education, but the director of secondary education in that department heads up our in-school project committee. And we are approved by the State Board of Education for credit and high school certificates.

Now, this is getting away from cost, but it has its ramifications.

The three studios request of the legislature and receive approximately a quarter of a million dollars a year for programing. This is divided not exactly evenly, because it depends on what is requested by which institution, who is representing that institution when the request is made, and then on the legislature. And that's a whole story by itself.

The network operation is a cost item that is handled by the state commission. I have the privilege of making such presentations or requests of the legislature. And we have been receiving approximately $200,000 a year to operate this network of three VHF stations, twelve microwave units, six automobiles, and the radio connections between them, including all of the engineering staff, so that our figures in round numbers break down into this kind of classification: administration, about $35,000; power, about $25,000; the engineering staff, about $55,000; tubes, parts, repairs, and maintenance, approximately $60,000; and programing assistance that the commission does directly for the Greater Birmingham Area Educational Television Association (which is an incorporation of the five public school systems in Jefferson County, including the county system, which as such is not a state agency and cannot request its own funds of the legislature) which in the past has been as much as $2,000 a month. And they themselves out of their own public school operating funds have contributed the balance of what might run from $50,000 to $75,000 a year to operate. They're doing a magnificent job, one of the finest jobs I think in the nation. No one has told the Birmingham association they couldn't do it for that sum, and they're continuing to do it.

We have a miscellaneous item of $10,000. That approximates $210,000.

We are anticipating the expansion of this network. We have not received any funds for capital outlay this year. We requested 3.8 million dollars, which I think must have literally scared the legislature to death, so they gave us nothing. And so we are having to tie together in baling-wire fashion a number of things that you have on the board for very respectable sums of money.

This is not generally known in Alabama, but it's no secret: We have been scouting around for equipment to activate certain allocations, and the city of Mobile—which is a fast-growing, great port and industrial center—is clamoring for this service.

It's a most gratifying thing to have a petition with thousands of names on it requesting educational television in their area, and it's the largest, most densely populated area in the state that does not have service.

So we have been looking around and have found a UHF transmitter already built to specifications for the channel which has been allocated to the city of Mobile, and we bought this transmitter and antenna for $8,500, and I'm looking for some more $1,000 microwave units.

As one of the Senators in the Senate hearing asked me, (I don't know whether this contributed to our failure or not on that occasion), "What are you going to do if we don't give you this money?"

And I said, "We're going to keep right on just like we have been doing."

And that may have been a bad thing to say.

But he said, "Well, I at least admire your honesty about it."

We're anticipating the establishment of other stations, particularly in the capital city of Montgomery, and I have my eye on a UHF transmitter that is available for $15,000, including other supplementary equipment and the antenna for this particular channel.

We've taken pieces of broken equipment just so we could see if we could use some parts. Consequently, we have put together this operation the hard way and if you have plans, magnificent plans that have been laid out here, I would advise that you use some of this same sort of thing, some of the same type of approach. You'll probably accumulate a lot of stuff that won't be any good to you at all, but you'd be surprised how much good some of it can be which you can put together.

Now, there are some manufacturers' representatives here and I know they won't like this. I have had one of them—not one here—tell me, "Please don't advertise what you got this for, because we have no more equipment like it."

And I know that it isn't the rule that you can get a microwave unit for $1,000 or $1,200. I might say in that connection that it took us three or four hundred dollars to bring this piece of equipment back to life. But three or four hundred added to $1,200 is considerably less than $10,000 or $12,000 or $13,000 or $15,000, depending on which particular unit you might be interested in purchasing.

I would like to add that some of the other shortcuts that we've had to use in establishing this network involve towers, as has been suggested. Not having any money for towers, we look for somebody else's towers, and we have been fortunate in using sites of the conservation department, the forest fire control, the highway patrol, or what not. We don't care whose property it is, just so long as we can get there free.

Most of our leases are the dollar-a-year type, and you'd be amazed at what difficulty there sometimes is to get a piece of property. I spent all day long on one occasion on the front porch of a farmer's house trying to dicker for a piece of land ten feet wide and twenty feet long, and he wanted $25 a month to lease it. We talked for hours, and finally got around to the point that we bought it for $25. But it was a long, hard row. And, incidentally, he also wanted the job as caretaker for the building that the station was located in, in addition to the $25 a month. But he became a good citizen, and we bought the property.

I believe that gives you an on-the-spot picture of what actually went into building what we think is a ten-million-dollar operation. And it can be done.

Session VII

COSTS

Presentation by

Mr. Carl Menzer

Chairman
NAEB Engineering Committee
Director
Stations WSUI, KSUI
State University of Iowa

I would like to say that the NAEB Engineering Committee has been working for a number of years on all sorts of arrangements of live networks especially for NAEB members, and we have collected a great deal of data on propagation and field intensity measurements, and so on, which are available in our files. Anyone who finds them useful is welcome to have them.

Recently, however, we have been considering a project which involves a live-wire line network to serve the radio stations of the NAEB. Now, as you know, the majority of NAEB stations so far are radio stations, not television stations; that accounts for our interest.

The area of the Middle West includes the majority of these radio stations, and that accounts for the fact that our project to determine some measure of costs included this one generally midwestern area.

Now, one of the questions which immediately comes up, of course, is programing, and that has been discussed, and I feel that on a mutual basis programing will certainly not present any problem.

Our project involved some sixty-odd radio stations at some fifty-odd pickup points, and we considered a round-robin arrangement where the contributions to the programing service could be made by any one of the sixty-odd stations. Assuming that we would take half that number, it occurs to me that we could have an extremely high-class educational radio service available throughout the full broadcast day.

Now, as to advantages, I think if you will use your imagination for a few minutes you can figure out many advantages that we haven't even considered. For instance, many of these stations in this area are small ten-watt stations which amount to very little more than closed-circuit services to schools—which means that they operate a very few hours a day and transmit only material to their schools. The rest of the time this investment is idle.

But if they were served with a high-level educational radio service throughout the broadcast day, they would not then be local closed-circuit operations, but would become community stations and would serve the entire community with fine adult education material.

I think possibly also the element of competition would mean that the general programing would be upgraded considerably. At least that has been my experience.

Now something as to cost. This, as I say, involves some sixty-odd radio stations, and they're connected in a round-robin fashion so that the sources of programing could start at any one of the stations.

However, it's quite obvious that many of them, possibly half, would not serve as originating sources but only as broadcasting points, and for that reason it becomes extremely difficult to make any definite costs for an arrangement of this sort. And it also becomes very hard to make any estimates on costs because of the fact that the telephone company seems to give you figures which vary from time to time.

We figured on the maximum basis—and this maximum basis, incidentally, is for eighteen hours a day—round-robin service would cost for the sixty-odd stations something like $20,000 a month. Now, obviously, it would be considerably less than this because, as I have pointed out, about half of these stations probably would not originate programs but would only take them and depend on other sources for their supply. Also the chances are that we would not operate eighteen hours a day, and that, of course, would cut down the costs.

This doesn't scare me at all. I think it would provide a service that would be well worth it, and no matter how you pro-rate that $20,000 a month over these sixty stations, the cost per station would be pretty small for the service that would be available.

COMPLETE ROUND-ROBIN RADIO NETWORK

(Stations to be served)

	WILL	Urbana, Illinois	University of Illinois	5 KW AM - 50 KW FM
	WSIU	Carbondale, Illinois	Southern Illinois University	3 KW FM
	KSLH	St. Louis, Missouri	St. Louis Board of Education	3 KW FM
	WWKS	Macomb, Illinois	Western Illinois University	3 KW FM
	WSUI	Iowa City, Iowa	State University of Iowa	5 KW AM - 3 KW FM
	KDPS	Des Moines, Iowa	Des Moines Public Schools	1 KW FM
	WOI	Ames, Iowa	Iowa State University	5 KW AM - 3 KW FM
	KWLC	Decorah, Iowa	Luther College	250 watt AM
	WCAL	Northfield, Minnesota	St. Olaf College	10 KW AM
	KUOM	Minneapolis, Minnesota	University of Minnesota	5 KW AM
	WHA	Madison, Wisconsin	University of Wisconsin	5 KW AM - 3 KW FM
These stations served by WHA's own network.		WLBL Auburndale, Wisconsin	University of Wisconsin	5 KW FM
		WHSA Brule, Wisconsin	University of Wisconsin	36 KW FM
		WHKW Chilton, Wisconsin	University of Wisconsin	51 KW FM
		WHWC Colfax, Wisconsin	University of Wisconsin	50 KW FM
		WHAD Delafield, Wisconsin	University of Wisconsin	52 KW FM
		WHHI Highland, Wisconsin	University of Wisconsin	50 KW FM
		WHRM Rib Mountain, Wis.	University of Wisconsin	114 KW FM
		WHLA West Salem, Wisconsin	University of Wisconsin	39 KW FM
	WNIC	DeKalb, Illinois	Northern Illinois University	10 watt FM
	WEPS	Elgin, Illinois	Elgin Public Schools	10 watt FM
	WNUR	Evanston, Illinois	Northwestern University	10 watt FM
	WBEZ	Chicago, Illinois	Chicago Board of Education	3 KW FM
	WGVE	Gary, Indiana	School City of Gary	10 watt FM
	WETL	South Bend, Indiana	School City of South Bend	250 watt FM
	WPSR	Evansville, Indiana	School City of Evansville	3 KW FM
	WMCR	Kalamazoo, Michigan	Western Michigan University	10 KW FM
	WKAR	East Lansing, Michigan	Michigan State University	5 KW AM - 3 KW FM
	WFBE	Flint, Michigan	Flint Public Schools	1 KW FM
	WOAK	Royal Oak, Michigan	School District of Royal Oak	10 watt FM
	WHPR	Highland Park, Michigan	School District of Highland Park	10 watt FM
	WDTR	Detroit, Michigan	Detroit Board of Education	2 KW FM
	WDET	Detroit, Michigan	Wayne State University	7.6 KW FM
	WUOM	Ann Arbor, Michigan	University of Michigan	10 KW FM
	WTDS	Toledo, Ohio	Toledo Public Schools	250 watt FM
	WBGU	Bowling Green, Ohio	Bowling Green State University	10 watt FM
	WBOE	Cleveland, Ohio	Cleveland Board of Education	3 KW FM
	WAPS	Akron, Ohio	Akron Public Schools	1 KW FM
	WKSU	Kent, Ohio	Kent State University	10 watt FM
	WSAJ	Grove City, Pennsylvania	Grove City College	100 watt AM
	WDUQ	Pittsburgh, Pennsylvania	Duquesne University	2.75 KW FM
	WOUI	Athens, Ohio	The Ohio University	10 watt FM
	WOSU	Columbus, Ohio	Ohio State University	5 KW AM - 3 KW FM
	WCBE	Columbus, Ohio	Board of Education City School Dist.	9 KW FM
	WSLN	Delaware, Ohio	Ohio Wesleyan University	10 watt FM
	WYSO	Yellow Springs, Ohio	Antioch College	10 watt FM
	WMUB	Oxford, Ohio	Miami University	250 watt FM
	WVSH	Huntington, Indiana	School City of Huntington	10 watt FM
	WSKS	Wabash, Indiana	School City of Wabash	10 watt FM
	WWHI	Muncie, Indiana	Wilson Junior High School	10 watt FM
	WIAN	Indianapolis, Indiana	Indianapolis Public Schools	250 watt FM
	WFIU	Bloomington, Indiana	Indiana University	10 KW FM
	WGRE	Greencastle, Indiana	De Pauw University	10 watt FM
	WBAA	Lafayette, Indiana	Purdue University	5 KW AM

SUPPLEMENTARY NETWORK

WILL	Urbana, Illinois	University of Illinois	5 KW AM - 50 KW FM
WSUI	Iowa City, Iowa	State University of Iowa	5 KW AM - 3 KW FM
WOI	Ames, Iowa	Iowa State University	5 KW AM - 3 KW FM
KUOM	Minneapolis, Minnesota	University of Minnesota	5 KW AM
WHA	Madison, Wisconsin	University of Wisconsin	5 KW AM - 3 KW FM
WBEZ	Chicago, Illinois	Chicago Board of Education	3 KW FM

WMCR	Kalamazoo, Michigan	Western Michigan University	10 KW FM
WKAR	East Lansing, Michigan	Michigan State University	5 KW AM - 3 KW FM
WDTR	Detroit, Michigan	Detroit Board of Education	3 KW FM
WDET	Detroit, Michigan	Wayne State University	7.6 KW FM
WUOM	Ann Arbor, Michigan	University of Michigan	10 KW FM
WDUQ	Pittsburgh, Pennsylvania	Duquesne University	2.75 KW FM
WOSU	Columbus, Ohio	Ohio State University	5 KW AM - 3 KW FM
WFIU	Bloomington, Indiana	Indiana University	10 KW FM
WBAA	Lafayette, Indiana	Purdue University	5 KW AM

ABOVE STATIONS TO FEED FOLLOWING STATIONS (ONE WAY) FROM NEAREST POINTS

WSIU	Carbondale, Illinois	Southern Illinois University	3 KW FM
KSLH	St. Louis, Missouri	St. Louis Board of Education	3 KW FM
WWKS	Macomb, Illinois	Western Illinois University	3 KW FM
KDPS	Des Moines, Iowa	Des Moines Public Schools	1 KW FM
KWLC	Decorah, Iowa	Luther College	250 watt AM
WCAL	Northfield, Minnesota	St. Olaf College	10 KW AM
WNIC	DeKalb, Illinois	Northern Illinois University	10 watt FM
WEPS	Elgin, Illinois	Elgin Public Schools	10 watt FM
WNUR	Evanston, Illinois	Northwestern University	10 watt FM
WGVE	Gary, Indiana	School City of Gary	10 watt FM
WETL	South Bend, Indiana	School City of South Bend	250 watt FM
WPSR	Evansville, Indiana	School City of Evansville	3 KW FM
WFBE	Flint, Michigan	Flint Public Schools	1 KW FM
WOAK	Royal Oak, Michigan	School District of Royal Oak	10 watt FM
WHPR	Highland Park, Michigan	School District of Highland Park	10 watt FM
WTDS	Toledo, Ohio	Toledo Public Schools	250 watt FM
WBOE	Cleveland, Ohio	Cleveland Board of Education	3 KW FM
WAPS	Akron, Ohio	Akron Public Schools	1 KW FM
WKSU	Kent, Ohio	Kent State University	10 watt FM
WSAJ	Grove City, Pennsylvania	Grove City College	100 watt AM
WOUI	Athens, Ohio	The Ohio University	10 watt FM
WCBE	Columbus, Ohio	Board of Education City School Dist.	9 KW FM
WSLN	Delaware, Ohio	Ohio Wesleyan University	10 watt FM
WYSO	Yellow Springs, Ohio	Antioch College	10 watt FM
WMUB	Oxford, Ohio	Miami University	250 watt FM
WVSH	Huntington, Indiana	School City of Huntington	10 watt FM
WSKS	Wabash, Indiana	School City of Wabash	10 watt FM
WWHI	Muncie, Indiana	Wilson Junior High School	10 watt FM
WIAN	Indianapolis, Indiana	Indianapolis Public Schools	250 watt FM
WGRE	Greencastle, Indiana	De Pauw University	10 watt FM
WBGU	Bowling Green, Ohio	Bowling Green State University	10 watt FM

BASIC NETWORK

WILL	Urbana, Illinois	University of Illinois	5 KW AM - 10 KW FM
WSUI	Iowa City, Iowa	State University of Iowa	5 KW AM - 3 KW FM
WOI	Ames, Iowa	Iowa State University	5 KW AM - 3 KW FM
KUOM	Minneapolis, Minnesota	University of Minnesota	5 KW AM
WHA	Madison, Wisconsin	University of Wisconsin	5 KW AM - 3 KW FM
WKAR	East Lansing, Michigan	Michigan State University	5 KW AM - 3 KW FM
WUOM	Ann Arbor, Michigan	University of Michigan	10 KW FM
WOSU	Columbus, Ohio	Ohio State University	5 KW AM - 3 KW FM
WBAA	Lafayette, Indiana	Purdue University	5 KW AM

Session VII

COSTS

Discussion Following Formal Presentations

MR. SCHWARZWALDER: I have a comment. I'm sorry Mr. Hurlbert had to leave. I don't think there is the difference between the two sets of figures that he thinks there is, with the exception of that $1,000 microwave unit. And the more of those he can find, the better.

The other point I would like to make I believe Mr. Klindworth did mention but it needs emphasizing. The costs on his study are based on standard list price. As all of us know, there is an automatic ten per cent educational discount, and, as all of us also know, if we start buying equipment in terms of sixty different units, and so forth—Am I bothering any of the commercial representatives?—I would expect substantial discounts even below the ten per cent.

If you figure those in, then the cost figures begin, I think, to agree or to come very close to agreement.

Is that a fair statement, Mr. Klindworth?

MR. KLINDWORTH: I think so.

MR. MENZER: Might I add one more thing? That is, if Mr. Schwarzwalder's plan of joining the Midwest with microwave relays is consummated, those facilities could be used in connection with the wire line network we propose to probably take care of at least half of the area, which would materially reduce the cost.

MR. SCHWARZWALDER: We're planning to use it that way. That's being taken into consideration.

MR. GUNN: I'm sorry Mr. Hurlbert isn't here, but I was a little concerned that maybe some people might be confused. In giving his figures, Mr. Hurlbert included his three transmitting stations in his over-all network, so when he was talking about "network" he not only meant the interconnecting facilities, but he was also including there high-power broadcast transmitters. So that's in his figure, and it's well to remember.

MR. RICHARD S. BURDICK: I'd like to comment too. I'm sorry Mr. Hurlbert isn't here, too. But there is one point here that I have talked with him about—so I'm not saying it because he's not here—but I would hope we would remember this basic point, particularly now that we want to expand to networks, and that is that I don't think we want to put educational television or radio together with baling wire. We have to avoid the field expedient if we can.

We're in competition with the commercial networks and operations. Everybody is a critic. And we have to be as good as they are in our own field. And I don't think that we should be like a high school student who puts a jalopy together for transportation. Let's not be satisfied with a jalopy. Let's try to get a Cadillac if we can, in order to maintain the degree of stature that we have established for ourselves, and to improve upon it.

MR. FRYMIRE: Thank you very much, sir. I think that's an appropriate note to end this session on.

Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

John C. Schwarzwalder, Chairman

Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Presentation by

Mr. Richard B. Hull

Director
Radio and TV Broadcasting
Ohio State University

Several years ago I had the privilege of covering the whole country in a survey for the National Educational Television and Radio Center. I looked at closed-circuit stations, on-the-air stations, and all the rest, and in the evaluation section of the little summary report I wrote on it, I said the following:

"Any effort to evaluate the total educational television development is difficult and is likely to be dogmatic. The multiplicity of purposes, activities, and installations which the term 'educational television' now serves to describe, does not lend itself to easy generalization. Like the blind man and the elephant, each participant and each critic in educational television tends to think the part with which he is familiar is the educational television totality, and that his own ground rules and his own case situation is universal. The fact that there may be several educational television elephants may escape him altogether.

Since the term first appeared in the late forties, the term 'educational television' has become ambiguous and created confusion and difficulty. As a crusader's criterion it may have been excellent; as a basis for formulating television and broadcast policy in education it's almost useless.

Education is a complex of processes and purposes. Television is a technical facility with a capacity to transmit sound and sight images. It may be used by education (commerce, industry, business) for many and various purposes whose requirements may and do vary greatly."

This same kind of evaluation applies to television and radio networks.

Now, I stress that, because the undertones I have caught in this conference illustrate to me exactly this kind of confusion. A person who is classroom-oriented has all his fears and concerns about a network in terms of what this may do to the status-quo situation of the classroom.

I remind you that, as far as television goes, the idea of using it as an instrument for total instruction or direct instruction or instruction in quantity is only one phase of the development.

For more than thirty-five years there have been efforts in this country to create minority, alternative broadcast services, first in radio, then in television, and the networking concerns of that particular application have nothing at all to do with formal instruction. They are not alternative to each other. They are complementary to one another.

Now, I remind you again, a network is merely a technical device, and the utilizations to which it may be put are almost endless. It's quite natural to think in terms of the application and not the possible applications, and to criticize what one might imagine is going to be done with a network in terms of some image already existent.

For years we have talked about American radio or television, British radio or television, Russian radio or television, and these are not totalities. They are simply a given application of a particular technical facility.

Now, within this country is NBC a network or is NBC a program service? The program service is the function. And the actual NBC network consists of six stations which NBC owns. The rest of the network, other people own, and they take or deny NBC programs as they choose.

The Mutual network is one which more closely parallels our adult education efforts in terms of radio broadcasting and television broadcasting—a mutual type of broadcasting structure.

But all of you are familiar with baseball networks. Throughout the Middle West there have been temporary hookups of FM stations for afternoons only for the period of a summer.

Now, is this a network? or is this a linkage? or what is it? That is a pro tem sort of thing.

In Ohio, once or twice a year we pull together fifty-five FM stations and a couple or three television stations when somebody like the Secretary of Agriculture addresses some group on our campus.

Every day of our lives our station, WOSU-TV, is connected to two commercial stations to take our children's programs and other programs.

Is this a network or is this a cooperative pro tem linkage?

Now, I was asked to speak in broad terms about the organization and administration of state television networks, interstate networks, and possible corporate structures. Who can agree on what forms of organization there are, or how powerful network vis-a-vis the stations can be?

Well, obviously, you can't start till you decide what kind of program service or linkage or relationship you want. The network is just a thing, a mechanical thing.

If we start to look at structures, we see the Alabama Educational Television Commission which Mr. Hurlbert described, which is the licensee of three, and ultimately more, stations. It owns those stations, and that is a corporate unit established by the state.

In Oklahoma they have a state authority which holds the licenses for two stations, again with a group appointed by the governor and confirmed by the legislature.

In Florida you have a state-created educational television commission which is a linkage proposition. It does not own the station licenses, but it serves to connect them. This is its essential purpose.

Here we get into the heart of the problem in some respects, and I will go back to my home ground if you will pardon me. In Ohio, the educational television network development began first in the State Department of Education and the state Board of Education, (which is an elected group, amounting to a board of directors, one from each congressional district, and which supervises the superintendent and the state department). They thought in terms of either direct instruction or supplementary instruction for the secondary and elementary schools.

On the other hand, the Governor's Commission on Education Beyond the High School is thinking of a network in terms of junior colleges and sharing university resources. This had shreds of the Southern Regional Education Board network thinking in it—sharing resources from campus to campus on a non-broadcast, but also on a broadcast basis, for students in and out of classrooms on the junior college level.

Now, to the stations in Ohio. Those on the air are owned by a community group—a community station. But Cincinnati is an atypical one because it consists of fifty-three school boards in three States; the membership constituency includes parts of Indiana, Ohio, and Kentucky.

In Toledo, there is another community station where the dominant aspect is the public school, again to some extent a private university; in Columbus, a state university; and in Miami, another state university, whose announced plans before the fact were to use this for specific extension education. The stations which will emerge will be a composite of university and community—in one case a whole regional community development, the Miami Valley.

Now, it was inconceivable to anybody there that any state authority could institute a curriculum which would make any school person sit still or any university president sit still.

Now, some of the innocents in the planning said, "We have got to have two networks"—that is, two complete microwave relay circuits. One would be public schools, and one would be university.

Well, you see, if you had one facility, depending on the number of hours, it could be like the FM baseball network—something at X hour and something else at another hour.

But the total corporate structure of Alabama or Oklahoma simply won't work in Ohio. It's this kind of problem into which you find yourselves entering. So I think it's most important to decide what you want to use it for.

Now, why has there been this interest in networking? Actually, it springs from economic need, I think. The early history of educational radio meant limited facilities, limited resources. That concert which was going on in New York or Boston or Los Angeles could not be obtained except by tape or some kind of wire linkage in Illinois or Iowa. And so this was sharing resources.

Also, it is an economic fact that if there is a central program service from which stations can pick and choose, and if you believe that a station should be on the air as long as possible—this is for free adult broadcasting—this helps sustain your program.

Now, if we can get into the instructional side for a moment—contrary to the ground rules which have governed the formation of commercial networks, whose key centers have been at one time Chicago, before there was a fall-off, then Los Angeles and New York, which was an economic expression. Where they had more talent and more resources in these cities, they governed their expansion by what would pay off. And since they were after big audiences, obviously the biggest flowering was in the population centers.

This has tended to be the case also in educational television, and this really represented more economic resource in a given cluster of institutions in a given city. But our need may be for networking in the South Dakotas and the Arizonas, where educational privilege is limited, or in Nebraska, as Jack McBride has started to pursue.

So we have a different economic formula to think of in this respect.

Throughout this conference, on the sidelines, I have heard this image again. We have a fixation in this country, it seems to me, of fear of what we call federal control. It's any kind of unitary control. And, obviously, things like the Post Office, American Telephone and Telegraph, and networks have to have some kind of trafficking system. Ten men can own an airplane in a club, but one man has to govern how it's scheduled, even if you elect him month by month.

I would see most of these structures probably developing within states because of the curiosities of educational organization within states. Then there come to be linkages.

Now, Franklin Bouwsma and I have talked a great deal about linking Ohio and Michigan, and from there it goes other places. As we see it now, we haven't even raised the question of administrative or corporate structure. Probably we'd start in on sharing the program need. We would get into a traffic problem ultimately. But presumably you do need a one-, two-, or three-state structure.

I will go back again to the baseball network for one hour, and a total program service like NBC. It might be that Bouwsma and Hull—with the two stations they represent and the cluster of stations that go with each—would like a certain kind of classical music or editorial or analytic comment of the kind that comes in Harper's or Saturday Review at night in a news program, and if there were enough of those things we might have to agree what would happen week by week and year by year. We might also have to do the same thing if there were a given educational program or lesson or series of lessons which we wanted to co-produce with the facilities of three states.

Now, if we came to the point of a corporate structure, there are many models around the country already. The SREB is one. The various councils that have formed under the aegis of the Ford Foundation for educational television are examples.

There is in southwestern Indiana, for instance, an organization which incorporates forty-seven school districts which work cooperatively to achieve essentially these objectives.

I would like to point out two more things.

Assume that you have a network which makes it possible to connect forty-eight states or ten states. How could you use that in terms of the older tradition of radio and television stations broadcasting to free-choice adult audiences? Out-of-school children would have one kind of service requirement. On either the secondary or elementary or the higher education level, formal instruction would take another form. And this is another use of the same collection of dishes and towers, and you might have a separate corporate structure for that. We don't have to assume single ownership for these things.

A third use might be what industry has already been engaged in for eight or nine years, the kind of thing duPont does or General Electric or the doctors when they have closed-circuit hookups over the country. Education might find repeated uses for that sort of thing, and it might want a nationwide network, and this is not any kind of superimposition of anything on anybody. That could be occasional.

The complication comes, I think, because to a great extent we're publicly financed and we find ourselves thinking in terms of familiar patterns to which, to some extent, we have to conform any time we conform to a legislative or social structure in our states.

Don't forget that any network that I know of has the phrase "option time." This is a double-barreled option. In terms of traffic convenience a network may have to have option-time schedule prerogatives. But the station always has the right of refusal, and there is no way of avoiding control more quickly than by turning a switch.

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Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Presentation by

Mr. William G. Harley

President
National Association of Educational Broadcasters
Program Director
Station WHA
University of Wisconsin

As Emerson expressed it, "Ends pre-exist in the means," and in addressing ourselves to the question of determining the choice of program materials for network distribution, one is immediately obliged to refer back to the subject Mr. Hull has been treating—the organizational and administrative structure for such networks.

Just how the constituent organizations relate to one another and participate in the network must inevitably determine the question of who decides what goes on the air and when. And, indeed, this important determination must be a major consideration in shaping the corporate structure.

Although our experience with educational broadcast networking is rather limited to date, the operation of existing activities and present plans for various types of networks provide some useful suggestions.

Let's look first at the oldest and largest of existing networks—the Wisconsin State Broadcasting Service, a state radio network.

The responsibility of the program service is shared by the university and the State Radio Council. The university station, WHA, operates under the policy supervision of a faculty committee, made up of representatives of the various colleges and departments of the university. When it was proposed that the radio service become state-wide, it was felt that the base of representation ought to be expanded to represent a wider range of educational interests and public services. Accordingly, the council was established, composed of the following members: the Governor of Wisconsin, the president of the university, the state superintendent of public instruction, the secretary of the Board of Regents of State Colleges, the director of the State Board of Vocational and Adult Education, a university representative appointed by the Board of Regents, and three citizen members appointed by the governor.

The university provides programs for its daytime AM station, WHA; the council uses the daytime programs of WHA and produces its own programs for evening hours.

Both agencies recognize that they are contributing to the same over-all project and the relationship is a harmonious one with all stations carrying the same programs. The council looks to the university for leadership in planning and producing; the university looks to the council for transmission facilities over which its programs can be extended to the entire state.

Program activities are coordinated through the sharing of appointments of key administrative personnel by the university and the council. In effect, the council in this manner employs the university radio staff as its agent in the production and presentation of the programs presented on its facilities. The director of the university's Division of Radio-TV Education, which operates WHA, also serves as the executive secretary of the State Radio Council.

Upon the director and the broadcasting staff rests the responsibility for the effective technical operation and development of the state stations, for the planned election of program topics and the allocation of time, for the invitations to the participating agencies or individuals, for rendering advice and assistance in the preparation and production of broadcasts, and in some cases, for the production by the station's own staff of programs prepared by others. Programs requiring or utilizing special knowledge are prepared under the auspices of appropriate individuals, committees, departments, or institutions of the State of Wisconsin.

When more than one department or agency of the state is concerned with a subject selected for program treatment, the part to be taken by each department in a prospective series of broadcasts is determined by conference between the departments. Differences concerning the proper division of the responsibilities among overlapping agencies are referred to the State Radio Council.

The determination of function and formulation of policy by the council is accompanied by responsibility for a continual review of the results achieved, and for any necessary modification of policy in the light of experience.

Now, let's turn briefly to the operation of a state TV network—the Alabama ETV network, which consists of three transmitting stations owned by the state and licensed to the Alabama Educational TV Commission. The stations telecast programs originated, created, and produced in studios of four program agencies under contract with the commission: Alabama Polytechnic Institute, Alabama College, Birmingham Area ETV, Inc., and the University of Alabama. Heads of the programing agencies constitute a program board. Five citizens appointed by the governor and approved by the state senate comprise the commission. The administrative officer is a general manager who answers directly to the commission.

The Alabama school broadcast project is under the guidance of an executive committee made up of presidents of these institutions, plus the state superintendent of public instruction, and the general manager. Each summer, workshops are held for the teachers and administrators involved. At these sessions past work is reviewed, plans are prepared for the following school year, and the printed materials are composed.

Though it is not "in being," here is a description of a regional TV network organizational setup. This is quoted from an article by John Ivey concerning the proposal of the Southern Regional Education Board to establish a network connecting 309 colleges and universities.

"The sixteen southern states would build and own the regional network. Through their Interstate Compact in Higher Education, the Southern Regional Education Board, as the agent of the several states, would develop cooperative agreements among the colleges and universities for the joint operation of the television system. These agreements, already in effect in other types of regional cooperation, will specify the scope of the network operation and the duties and responsibilities of the SREB and the member institutions. Each of the signatories of the agreement will be a member of the Regional Television Network Council, the over-all policy-making board for the network. The Network Council would operate within the general SREB policies as outlined in the compact.

"The SREB, as the agent of the network, would in turn contract with specific institutions for the time of television teachers, the use of television production facilities, the services of course-planning and evaluation committee members, and the services of testing bureaus. Member institutions would maintain complete discretion as to the extent of their participation either as purchasers of network services or as sellers of services to the network.

"Acting for the Regional Television Network Council, the SREB would handle the work of the course-planning and production committees, contract for the production services of institutions and professors, develop and maintain arrangements for the operation of the network technical facilities, schedule the program operation, and handle the financial relationships among the network, institutions, and states."

There we have three organizational arrangements. These give us some possible guideposts, but obviously no one pattern will serve for all situations, and every plan must be tailored to meet the needs of the area served by each network.

Another network activity whose operation is instructive is that of the National Educational Television and Radio Center. Although it is not an interconnected network, it is a network service, and it is involved in many of the same problems of program selection and production as possible regional networks.

As you know, the Center provides its affiliates with high-quality program features distributed on film (and soon via videotape). In this situation, too, the affiliates act as both consumer and seller. Most of the programs distributed are prepared by members themselves on an exchange or contract basis for the Center; thus, affiliates profit from their production activities and benefit by sharing in each other's strengths and resources.

Affiliates participate in both capacities in having a say as to what goes into the programs. As producers they build in their own values consistent with the goals of educational broadcasting; as users they are able to come together twice a year with the Center staff to evaluate and plan the development of future network programing. Moreover, they are represented by an elected Affiliates Committee which meets frequently with the Center staff to discuss matters concerned with relations of the stations to the network.

At all times, of course, the stations are free to reject any portion of the program package they do not feel appropriate, which duplicates local programing, or is in any way unsatisfactory. To help in making advance judgments on up-coming offerings, they can obtain viewing prints of sample programs for each series.

The same sort of things can be brought out about the nature and operation of the NAEB tape network: a mutual sharing of resources to benefit each station by providing an optional selection of superior program materials to supplement and enrich local offerings.

Another approach to establishing the mechanism for program selection and utilization is to proceed on the basis of a realistic appraisal of the problems and dangers and then to see to it, in so far as these matters can be foreseen, that whatever mechanism is developed takes these problems into account and builds in the appropriate safeguards.

A number of speakers on the panel discussing the effects of networks on the educational community expressed worries they had and problems they foresaw. Without enumerating these concerns again, it is perhaps fair to summarize them as centering around apprehensions about the loss of local or state control of curricula and fear that educators might lose the responsibility for televised education.

In my opinion, these alarms are unwarranted. I do not say there are not many problems and difficulties to be faced—but I have no fear of Orwellian bogeymen or Big Brother concepts.

First of all, we have a record of responsible operation over a long period of time in educational radio and for six years in ETV. I do not believe the record of educational broadcasting to date shows irresponsibility or capricious disregard for educational values. And why? Who operates these stations? Educators. Either the stations are owned and operated by educational institutions or by nonprofit organizations in which the schools, colleges, universities, and educational administrators are full participants. Take, for example, the setup of the Boston Educational Television Community Station WGBH-TV. The station is operated by the WGBH Educational Foundation, with the advice and cooperation of the Lowell Institute Cooperative Broadcasting Council. The foundation has a Board of Trustees composed of the president and treasurer of Harvard University, the president and treasurer of MIT, the chairman of the Twentieth Century Fund, a trustee of the Lowell Institute, the chairman of the Board of Trustees of the Boston Symphony, Inc., and the director of the Lowell Institute Cooperative Broadcasting Council. The council has a membership consisting of representatives of Harvard, Boston University, MIT, Tufts, North Eastern, Boston College, Lowell Institute, Brandeis, the Museum of Fine Arts, the Museum of Science, the Boston Symphony, and the New England Conservatory. Surely such people are not out to sabotage education!

Moreover, the school broadcasts of WGBH-TV are presented under the guidance of the Eastern Massachusetts Council for Schools, composed of representatives of 120 school systems, who determine the content of programs to be presented for school use. The council includes independent schools, public schools, and parochial schools.

The point is that educators have always been in control of educational broadcasting; they are now, and they will be in the future. For, however educational networking develops, in whatever patterns of state and regional interconnections and program sharing, the same people, institutions, and agencies now involved in educational broadcasting are going to be involved in these future developments.

In all of these arrangements—in existing stations throughout the country—educational programing is being planned and presented in the fullest cooperation with the appropriate educational consultants, specialists, supervisors, and administrators. Programs are not prepared for schools in a vacuum but with the complete cooperation of the school systems they are designed to serve and with the aid and guidance of the teachers who will utilize them. Elaborate systems of committees, councils, and interlocking boards are in operation to insure that the educational stations are responsive to the needs and interests of the educational community and that those responsible for curriculum are given a responsible say as to what is broadcast to the schools.

Now I would like to expand slightly on two points mentioned yesterday by Dr. Schwarzwalder:

1. In any network setup, the participating stations and schools will always have the privilege of selection and rejection of what is offered. Furthermore, it is expected that the stations will continue to do local programing and will use the network service to supplement not supplant the local schedules.

2. Networking is not an either-or matter between videotape and live local interconnection. Both are important; each should be used for its special values. It is obvious that for purposes of distribution and presentation of topical material, the interconnected system is important. The flexibility provided by tape affords many aids for production, but anything on tape can be sent via tape over the interconnection and also stored on tape at the other end of the line. This provides two major values—freedom in scheduling the program and an opportunity to preview the program before rebroadcasting in the local area. So, here again, are built-in safeguards for the guarantee of local option.

There is another matter I'd like to mention just to keep things in perspective. Many of the speakers at this conference have discussed ETV and radio as though it was solely concerned with instruction in the schools. In point of fact, the majority of programing is not in this area and although I believe that, to meet the tremendous needs of the schools, more and more of the schedule of ETV stations will be concerned with formal education, certainly a good deal of attention—and properly so—will be devoted to adult education: both systematic and general, vocational instruction in farming and homemaking, public affairs, and general cultural exposure. The contribution which network operation can make to general adult education through the pooling of resources of several communities and the dealing with matters of direct concern to people of the state or region are tremendously important.

I mention this matter, not because appropriate supervision and responsible management is not also necessary in this area, but merely to indicate that there is an important area of educational broadcasting which is not directly the concern of school administrators and curriculum specialists.

Now in all the preceding, my intention was not to present a Pollyanna posture. It is not enough for a conference such as this to content itself with reviewing the inspiring record of the constructive and beneficent possibilities of the electronics media. For we have had some disturbing examples at home and abroad of the destructive and malignant use made by the uninformed, unscrupulous, or fanatical to misinform and mislead. It is clear that any faction which receives control of broadcasting facilities acquires a powerful means of enforcing its views or purpose upon a large number of people.

In seeking to reintensify our efforts in a bipolarized world to preserve individual liberty and democratic processes, the use of radio and TV must be safeguarded so that all voices have reasonable assurance of access to these instruments.

This means that the development of educational network systems must provide for widespread participation of educational and public service agencies and those citizens whose contributions to the public interest and welfare can be effectively extended by broadcasting, and that responsibility for management and operation of the facilities must be vested in a council of members who are well versed in the spirit of the educational and service policies, problems, and objectives of the state or region to be served.

Finally, let us remember that the perplexing problems of policy which will arise from network use of radio and TV facilities are those which have always confronted the educator: perpetuating the achieved state of social security by handing on the best in established patterns of thought, and at the same time encouraging "the continual fearless sifting and winnowing by which alone the truth can be found," to quote from a plaque on Bascom Hall at the University of Wisconsin. This is the twofold purpose of the public servants entrusted with the operation of educational agencies by our society—passing along that which is good and of true report from the past, while preparing the way for orderly correction of the recognized shortcomings of the present system. This is the problem confronting the administration of any new radio or TV network. It is a problem we can leave with confidence to those traditionally entrusted with this problem—the educators.

Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Presentation by

Mr. Lawrence Frymire
Manager
Stations WKAR-AM-FM
Michigan State University

Your chairman has assigned me the task of talking with you about state and interstate radio networks, with special attention to how they may complement TV networks; also the problem of program duplication between radio and ETV network developments and the problem of joint use of equipment in such operations; and, finally, I am to comment on the administration of such networks.

I am very pleased that he framed his words in such a fashion—that is, how radio may complement ETV—since to me this indicates a belief that ETV and educational radio can work together for the betterment of our educational system.

During the past several years we have all been aware of the particular emphasis placed on ETV in most sessions which bring educators and educational broadcasters together. And well it should be thus, for there has been a vast learning job to be accomplished by those of us in this business, learning the whys and hows of ETV.

If I am not too presumptuous, I believe this learning job has been accomplished with a high degree of success to this point, and so it is time now to study again and consider again the extensions of the ETV instrument, and also to again consider how we may use radio better and more efficiently as a single instrument in itself, and, more importantly, it is time that we study ways of bringing both ETV and radio to focus on the tasks in American education which they can accomplish as a team.

It is obvious to me, and I am also sure as well to you, that radio and TV have peculiar qualities which enable each to reach people with certain types of educational information or processes. As I scan the program logs of many ETV stations and compare them with current practices or long-standing practices in many educational radio stations, there is not a great or significant difference between them. What has actually happened in many areas of the country is that ETV operations have been superimposed on already existing radio operations, sometimes duplicating these operations, with a picture added—and sometimes at a high cost.

But lest you infer that I am a frustrated superheterodyne man with a chip on my shoulder about the orthicon and vidicon people, I assure you that is not the case.

What I merely point out here is that, in the rush to employ this new educational tool, we have failed to improve and/or extend our use of already existing facilities on the firing line.

Radio is in a position to join many if not all proposed ETV networks in most areas of the United States. As has been brought out at earlier sessions of this conference, this is especially true in the Midwest, Northeast, and Southeast, and in certain areas along the Pacific Coast. And if, among the several proposals which have been brought before this conference, we can remember to include radio in our plans, I for one believe these sessions will have accomplished a real service.

I am certain that there are those among us at this conference who are experienced and knowledgeable enough in all areas of educational broadcast programing and needs to devise network plans which will avoid the costly duplication that might arise otherwise. This I suggest would be high among the list of problems to be solved in the development and ultimate operation of educational broadcast networks.

There is before us a rapidly growing population in need of special services which networks as well as individual stations should serve. We should spend considerable time and effort seeking ways in which we may serve these needs.

Special groups among our audiences can be served best by perhaps considering program series aimed more sharply at their needs. Professionals, such as lawyers and doctors, can be served with programs designed in cooperation with their own professional societies and associations. Other occupational groups—certainly the teaching profession—are in need of this "in-service" type of programing as well.

Perhaps we might take on the job ourselves of informing teachers in the wider uses of mass media in their teaching situations. We have for a long time been suggesting that courses of this nature should be included, and helping with their inclusion, in the training of our teachers. But only a token degree of success is so far evident.

We have authenticated research to prove the wise use of mass media as teaching tools. ETV and radio could provide fascinating programs for many areas of in-service training for our teachers. While aimed at this specialized audience, programs can also be generally interesting and valuable to wider segments of the population.

While the techniques of radio and TV are different in many ways, we are still using microphones, cameras, turntables, head sets, and what have you, as well as people of ability in the use of both media. So I have the belief that the problem of the joint use of equipment, both in studio operations and also in transmitting facilities, is not really so much of a problem as some would have you believe.

It continually amazes me what our engineers can devise and dream up by way of improvising or "making do" in many broadcast situations. And while certain specialized equipment requirements exist for radio or TV, I say leave it to the engineers—this problem of joint or cooperative use of broadcast equipment. I have every confidence that they will save us money and effort.

For one thing, they already have the well-established policy of never throwing anything away. Who knows? Tucked away in some of those engineers' "gosh" holes, there may be equipment valuable and adaptable to networking situations.

I refer you to Cy Braum's excellent and brief statement the other day during Session III of this conference. Cy and others of the technical group continually offer valuable and sometimes imperative information for broadcast planners and dreamers. These men are way ahead of us in their concepts and knowledge of what we can do with these electronic educational tools.

The final point your program chairman assigned me is to comment on the administration of radio and ETV networks—the implication being that there exists a question as to the joint or separate administrative organization of such networks. Without being facetious, I say that there can be no successful administrative organization of such networks without including a close and cooperative joint administration of such networks in both radio and television.

Those of us in communications must talk to one another, besides concentrating on talking to our listening audiences. I am sure you have all found times when communications have been at their poorest among your own communications enterprises. Let's not have this occur in the plans that we have been proposing and talking about here.

These plans carry with them the inherent requirement for us to use our knowledge and experience together if we are to successfully develop the extended use of educational material into workable networks of any description or type we may ultimately develop.

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Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Presentation by

Mr. Hartford N. Gunn, Jr.

General Manager
Stations WGBH-FM-TV
Lowell Institute Cooperative Broadcasting Council

Four major administrative problems, some of which have been discussed by previous speakers, have presented themselves in the establishment of our radio and television networks in New England. The first of these is the type of organizational structure: Should it be formal or informal? This largely depends on the size, objectives, and method of financing the network. If it involves only a few stations with a minimal budget and limited objectives in terms of program origination, hours of operation, and like factors, then the simplest organization, such as a loose association of stations, is best. On the other hand, as a network grows in size, objectives, and financial commitments, a more formal structure will be needed. This may be an independent commission or corporation with its own board of trustees and full-time personnel having broad executive powers in the areas of programing, production, and engineering.

The second major administrative problem which we have run into and which I think becomes more serious as a network grows in size concerns engineering and technical operation. One aspect of this problem is the securing and maintenance of suitable radio and television frequencies. This is especially vital to a network dependent upon off-the-air pickup of other stations. For example, a station independent of the network and yet within its coverage area, may be granted a frequency adjacent to one of the member stations and thereby introduce such interference as to make the entire network operation impossible. It is essential, therefore, that the problem of securing and maintaining appropriate frequencies be given particular attention when off-the-air pickups are contemplated.

This is also true, as we have discovered from others, in the problem of finding suitable microwave frequencies for interconnection.

An even more important technical problem is that of setting and maintaining engineering standards of operation and repair of studio, transmitter, and relay equipment. It's an old saw, but like the chain, a network is no stronger than its weakest link. Every piece of equipment, every technician, every station that originates or relays programs, determines the technical quality of what the network audience sees and hears. This matter should not be left entirely to the individual stations and their engineers. It is the responsibility of the over-all network management to see that the best possible equipment is properly installed, maintained, and operated.

The third administrative problem is that of network programing which involves the questions of what programs are to be produced, when, and by whom. In this connection, you may profit by hearing about a mistake which I think we made. We felt that all we had to do was to establish a network in the engineering sense of the word and then merely to exchange programs by offering one another what we thought was worthwhile material. Aside from some traffic and scheduling problems, we believed that this was all there was to it. This, of course, will work, but it is a great mistake because a live, interconnected network presents a wholly new dimension in programing which should be explored and exploited to the utmost.

In this sense—though I know Mr. Hull was using it in another context entirely—a network is more than merely a technical facility. It should pull together your program department and that of all of the program departments that are concerned with the network and create something wholly new and different from merely an exchange of existing materials.

The network should free the program and production staff of an individual station from the necessity of producing hour after hour of programing on small budgets in order to fill the broadcast day. The staff, then, can create a new schedule incorporating the best material of the network and can concentrate its attention and resources on, (a) producing programs focused on local needs and problems and, (b) producing major programs for the network.

Wherever possible and appropriate, the resources of network stations should be employed in a common program objective. This is not for every hour of the day, but there should be certain objectives that are laid down by all program departments to which all stations contribute. Let me illustrate this point with the following example: Edwin Lahey, chief of the Washington Bureau of the Knight Newspapers, stated to Louis Lyons on our program, "The Press and the People," that one of the greatest problems facing the reporter (and the broadcaster) today is "to synthesize and personalize the vast problems that by the very nature of our society and our government are too big to handle." He singled out the subject of inflation as being very difficult to report intelligibly to the public. This complex topic has been poorly handled by other media and would be difficult enough for an individual educational station to cover adequately. But, by pooling the resources available to a network, we could make a significant contribution toward a better public understanding of the problems of inflation. Assuming the existence of an eastern regional educational network, it would be possible to draw upon economists from universities such as Harvard and Yale, industrialists and financial leaders in New York, government economists, politicians, trade and labor leaders in Washington, as well as the viewpoints of consumers who reside in this region. Certainly, the accessibility to many of the resources so long denied to educational broadcasting would help to ensure the significance and value of such a series for the network audience.

Another example of using the total resources of a network is to be found in the area of in-school broadcasting. A new and expanded curriculum can be created through network distribution of school programing. Moreover (using our hypothetical east coast network, and this is certainly true in other parts of the country as well) new elements can be introduced such as complete sessions of the United Nations, Congressional hearings, Presidential press conferences, symphony concerts, visits to historical sites, and so forth.

I think any of us in educational television and radio can see the tremendous possibilities of drawing in new elements, not just distributing our standard course material, but bringing in those things which we have always said we would like to have in our classrooms but have never been able to have.

In short, network administrators must see beyond the straight checkerboard exchange of programing and attempt to build something new, more effective and constructive—programing that fully utilizes the resources of the network.

Mr. Harley wanted me to add one additional thing. When you are considering these program resources through a regional, state, or national network, you have one of the most valuable instruments for the stimulation and creation of new educational radio and television facilities in the country.

To cite an example with which I am personally familiar—and Keith Nighbert is here from New Hampshire to confirm this—there is no question but that the availability of programing from our station, and the availability of programing from the National Educational Television and Radio Center to the people in New Hampshire made it possible for them to create a station which they would not have otherwise done, because the tremendous costs of underwriting a program operation in New Hampshire would have precluded any educational television facility in that state for a considerable number of years.

But with the availability of programing from at least one station and from a national network, the people of that area were encouraged to begin their own station. And with that, of course, will come the development of their own local programs. But they may take their time, and they may husband their resources until they are ready to use them, because they have program material available to them.

So this question of networking is of more than passing interest to those of us who are interested in the creation of new educational outlets across the country.

Last, but not least in a discussion of administrative problems, is the question of how to finance an educational radio or television network. Our chairman, John Schwarzwalder, asked me to talk specifically about this particular problem. I am not sure why he asked me to talk about this subject— whether he thought I knew how to find money, or whether he thought I had some to give. I certainly can assure him that it's not the latter and it's too early to tell whether I have shown any talent for the former.

There are as many ways to finance—"finance" is a high-class word that we like to use for money-raising—there are as many ways to finance an educational network as there are ways to finance an individual station. In fact, you are quite likely to find that in financing a network you have to finance individual stations, unless you live in an area where there are a number of existing educational radio or television stations strategically located to provide the coverage and service desired. This certainly is not true of New England.

I think the sources of funds for educational broadcasting are well known to all of us. They include local and national foundations; local and state organizations rooted at the community level, such as business and fraternal organizations; individual subscriptions and/or contributions from your present or potential audience—always with a weather eye out for those rare birds known as the "large donors"; public school funds; college and university treasuries; state legislatures; federal government sources; and, though we hate to resort to it, dues and assessments of existing stations.

At some point it will be necessary to make a fund-raising presentation, either orally or in writing, to one or more potential donors. Essentially, this presentation should answer the questions of what it is you aim to do, how you propose to do it, who will do it, what it will cost, and what are to be its effects. It is helpful to lay out the entire proposed network even though later on you may expect to ask for and receive only a part of your total request. The proposal should not be so grandiose and complicated as to seem unrealistic and incapable of execution. Yet its concept and scope must be broad enough to capture the imagination and interest of the potential donor. This, of course, is easier to say than to do, but many good ideas have been lost through the inability of a fund-raising executive to put his dream across in just these terms, contradictory as they may sometimes seem.

Two other points come to mind. First, if legislatures and other state groups are to be approached for funds, it is well to remember that they have obligations to an entire state. The proposed network, therefore, should be planned with a view toward servicing that area. Secondly, it is useful to have several alternate and less-expensive plans that are fully workable, that make a useful contribution to the total concept of the network, and that are capable of expansion even though the coverage may not be as extensive as originally proposed.

Another area of network financing that should be discussed is the possibility of federal support such as proposed in the Magnuson Bill for the purchase of educational television equipment within the various states. In my opinion, if such support should be forthcoming, educational radio should be included as a potential recipient of equipment along with educational television. It may not be possible with present funds and television allocations to provide a sufficiently large communications system to meet the urgent and growing needs of our educational system. The possible use of facsimile, slow scan television, as well as the single-channel and multi-channel audio circuits that can be incorporated into educational FM radio networks, provides another extremely valuable educational communications system to supplement and complement educational television. Any federal bill for educational broadcasting equipment, therefore, should include radio as well as television.

I think Mr. Frymire has done an excellent job in showing you how the two may be tied together to provide a more effective and total service than any one medium alone can furnish.

There has been considerable debate over the general merits of bills, such as the Magnuson Bill, to support the purchase of educational television equipment. The subject is too complex to go into here, but I should like to make one observation based on eight years of trying to build an educational radio network in New England and six or more years of the same for television. We have made some progress with which we are very pleased. Nevertheless, it appears that without some sort of substantial outside help and stimulus, we will discover that for many years to come the benefits of educational radio and television broadcasting will be confined to large metropolitan areas and to a few scattered university centers.

This is something we feel very keenly, being adjacent or close to the states of Maine and Vermont.

Incidentally, I might add parenthetically that one of the suggestions I have here concerning these bills was that an acceptable bill might be put together if the states were asked to match the funds for equipment that the Federal Government might provide. I don't think that should be required. Certainly, if states with the financial problems—I'll take the two I'm most familiar with—that face Maine and Vermont are asked to furnish the hundreds of thousands of dollars necessary to operate these facilities year after year, that is quite sufficient—and it would not seem necessary that in addition they should have to put up matching funds on a one-time basis for equipment.

In other words, I'd like them to keep their eyes on how to operate and maintain the station and not have the additional and complex problem of how to finance and establish it. It has been suggested, incidentally, in that connection, that, instead of matching funds, matching equipment and resources might be used. But there are no educational radio and television broadcast facilities in Maine or Vermont, and, therefore, they would have nothing to match; so this is not a solution to the problem.

The need of adequate educational facilities for both adults and children is greatest in the small towns and rural areas of our states. Networking readily gives us the technical means by which to bring to these areas the resources of large metropolitan centers with their museums, universities, and other great institutions. The financial means to accomplish this task are not at hand. One can only hope that there will be a greater awareness on the part of potential financial contributors that state and regional networking is the most economical way to bring increased and better educational programing services to a larger audience. Certainly, if this statement holds true, then funds from some source or sources will be forthcoming.

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Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Discussion Following Formal Presentations

FATHER STEINER: I'm going to address this question to one of the senior citizens, but I'd like to preface it with a short statement. I have never had any concern nor do I have any concern now that the educational television mechanism and also the programs, of course, will get out of the hands of educators and into the hands of non-educators.

However, even as an educator, may I make the statement that not even educators, for all their perfection, are God. And that doesn't mean I don't trust them all, but I do think, though, that we should be idealists without illusions, without any illusions about ourselves or our fellow men, or God if you wish. In other words, He helps those who help themselves. And that's why I'm trying to help myself here.

I speak from actual experience, and I don't say this critically, but this has bearing on a very vital part as far as I am concerned with the administrative setup of the network, state or regional. If the original plan in metropolitan Detroit had gone through—namely, that Channel 56 would be owned, established, and operated by government funds, whether it was local or state or whatever government funds—in spite of the cordial invitation to the privately supported institutions to participate, it is a fact that any taxpayer in Detroit might have challenged the right of the privately supported school to participate.

And this was actually not done because the original plan never went into effect, because the argument for the money from the board of education and the state legislature was that education by television is of the same nature as education in the conventional way. It's just that it's a different mechanism.

So to avoid that problem and to continue to get along well together, we then established the community station.

Now, the question I would like to ask: Mr. Harley, would you as senior citizen care to commit yourself to this: That the NAEB, as long as you're president, recognizing the differences in administrative setups, would say probably the community type of state networks such as are already in effect would be the desirable form of administration? And if you don't care to say it, and I can understand if you won't commit yourself, then I will see Mr. Hull privately and I'll see you. (Laughter)

MR. HARLEY: I don't think I would like to say that this is necessarily the specific way to do it, but certainly, as I think I indicated in my talk, in our process of reintensifying in a bipolarized world the preservation of individual liberties and the democratic processes, we need to have great concern with responsible use of the mass media. We have had ample evidence both at home and abroad of what can happen if these instruments of mass communication are used irresponsibly by fanatics, by people out to impose a particular point of view upon their fellow beings.

And many people have pointed out these instruments are in themselves neutral. They can be used for good or bad.

So in any consideration of development of this networking scheme, we need to insure that reasonable access to these facilities is provided to all those who have something of importance and worth to communicate to the people of the country.

And our best assurance, I think, as I have indicated, is to put it into the hands of those who have been entrusted with this, and to set up a mechanism along democratic processes with a very wide base of participation and machinery for constant review and analysis of what is being done.

And any of these mechanisms, whether it be based upon the community station pattern or something comparable to that, must permit this kind of general participation by all, in being able to suggest their points of view, things that are worth considering and reviewing and being brought to the attention of all our people.

DR. WALTER B. EMERY: I'd like to make just a brief comment. I think this is one of the most helpful discussions that we have had in the conference. There is a feeling which still persists among many educators that the development of state and regional networks will destroy local autonomy in education. Now, as has been suggested, this really is a false image. I don't challenge the integrity and the honesty of people who feel this way, but I think the evidence is quite clear that this is a false image.

One of the great values that comes from state and regional networking in the field of education is the fact that you are able to share ideas and information, and this, of course, contributes to local education. I think that if we think in terms of economy for local education as well as quality for local education, inevitably we will want to develop these state and regional networks.

My final point is that the National Association of Educational Broadcasters and other educational groups especially interested in the enlightenment of our people should attack and put major emphasis upon destroying this false image, because in my opinion this stands in the way. And I might say that I believe that this probably was the main reason why the Magnuson Bill failed.

DR. SCHWARZWALDER: Thank you, Dr. Emery. If I may put my comment in, may I say first of all that the principle of equal access to all, as Mr. Harley put it, who have something worthy to say is, of course, something that must be insisted upon. It cannot be guaranteed. It will always have to be fought for. But we are among the people who will have to do that fighting.

May I add also in support of what Dr. Emery said, the fact that for almost seven years—well over six years—educational television stations have been on the air. In spite of what I heard last year about this time to the effect that perhaps academic freedom could be stultified in some way by means of educational television, the point remains that in this six and a half or seven years of ETV broadcasting, with forty-four stations now, there has been not one instance which has come to the official attention of the American Association of University Professors, for example. And I wonder if some of our state schools and others could make equally strong statements?

This I think we are all dedicated to.

MR. JAMES McPHERSON: I was interested in the choice of words in the idea of fighting this opinion. I don't believe it's possible to fight that opinion, because that creates a great deal of antagonism. The only way it can possibly be fought is by involving the groups from whom a misunderstanding is coming, involving them in the whole process of helping to do the kind of planning that is taking place here.

I had an interesting experience a few years ago that was helpful to me. I ran into a group of people who were particularly interested in language instruction, and they involved me in their process with the idea that I, in the field of audio-visual, might be able to contribute something. And as I sat with them, I discovered that their point of view was that I would be an implementer, that I would have nothing to offer except to put their ideas into being. And I found I questioned some of the things that they were talking about.

We had also in the group several other people who were also brought in for this purpose of helping the language experts accomplish their purpose. And at first they were very rebellious to think that any ideas, any good, could come that would help them, the experts, in their field of work. Then as the group worked together, it became very obvious that from every point of view, even some that had no connection with language education, great good was coming. And finally there was a synthesis of thinking that did not represent any one person but represented everybody.

I have been interested in educational television for a very, very long time now, even though I haven't been working in it directly, and I have been very much concerned by the fact that I have gotten into educational television meetings and I have seen a feeling that, "Well, people don't understand our point of view." And I have gotten into other meetings where I find their reaction is, "Well, the people in charge of educational broadcasting don't understand our point of view."

We talk glibly of this elephant. You know the old story of the blind man and the elephant. And I was interested in your comment that there may be many elephants. But it's one thing for us to talk about that and then realize that we have to come to a realization that we ourselves may be guilty of finding that the elephant to use is a tree or a spear or a rope or a snake.

The only possible way that that can be remedied is, I think, the step that has been taken here, the step that is being taken in the work that your president and Charles Schuller and others are doing to involve other people in the actual planning that is taking place.

I see some rather great needs for it.

One of the graduate students at Wayne recently completed a doctoral dissertation which was a study of the research on the use of educational television in the teaching-learning process. His analysis pointed out that, of all the studies taking place, a little over 90 per cent of them have been concerned with only one function of television—that is, information transmission, one-way primarily. The rest of the 10 per cent have dallied about with attitude formation. Almost none of them has had anything to do with this whole process of teaching-learning, involving a reaction from the learner, where there was some analysis of what is actually taking place when a person has learned—not just gotten information he can repeat back, but when he has been able to do something because this thing has taken place, the televised experience.

This doesn't mean that what's been done up to the present time isn't wonderful. I think we need many more millions of dollars put into all the aspects of television, including better information transmission. But it certainly is true that to fight this thing that you're talking about we have to work with the people who have the other concerns that are a part of the educational picture.

DR. EMERY: I think we ought to press forward, and I agree with the gentleman that sometimes waging war is not the way to accomplish what you want to do, and I think the most effective weapon is information.

MR. MARK JOHNSON: To those who fear the domination of the educational process, might we not say: "Oh, ye of little faith in democratic ideals and processes!" We have been fighting, shall I say, provincialism and parochialism among educators for over a hundred years. Until the 1800's it was against the state—that we must not permit the state to do anything, and everything local. Now it's that we must not permit the region to do anything. We're in the same fight and we will continue. We're going ahead.

DR. SCHWARZWALDER: In other words, it's a matter of tactics now; instead of dragging people kicking and screaming into the twentieth century, it would be best to persuade them to come in?

Session VIII

ADMINISTRATION PROBLEMS AND CONFERENCE SUMMARY

Summary by

Dr. John C. Schwarzwalder

Conference Chairman
Director
Twin City Area ETV Corporation

It's now my pleasant task, as conference chairman, to express the gratitude of the NAEB to the National Education Association for its facilities, to the Greater Washington Educational Television Association for its hospitality (and for the numerous small favors that have been done for us by them), and most especially to the United States Office of Education, without whose financial assistance and, without whose constant encouragement, the conference could not have been held at all.

In our first session the mood and the tone of the conference were set by Dr. Flemming, who urged our most serious consideration of regional network broadcasting, which he characterized as an opportunity which must be considered as of tremendous potential importance. This was seconded by Commissioner Derthick, who asked us for the best efforts of which we were capable, counselling a thorough and objective approach to our deliberations. Dr. Stone then put the background and the purpose of the conference into focus, and Professor Hull gave an overview of the entire problem.

The next session, which was devoted to the question, "What Have We to Distribute?" was, I thought, a brilliant discussion on the part of all four of the participants, ranging from the particular of Louis Lyons to the general of E. W. Ziebarth, to the particular again (if you can say anything as large as the Chicago Junior College experiment is a particular) by Dean Erickson, and finally, a view of the entire development of ETV subject matter by Mr. Steetle.

The following session might, in my opinion, very well serve as a model of its kind, because it is a matter of envy to most managers that the engineers—I will not name them all particularly—knew exactly what they were talking about at all times. They had been given a problem. They arrived at the answers quietly, patiently, and in such a fashion that there is no possibility of argument.

They were to answer the question, "Are these networks technically feasible?" They answered the question. They put in certain qualifications, but the answer came out, "Yes," that networks certainly are technically feasible. The engineers answered the question in such detail that I think none of us can very well have any further doubts about technical feasibility.

This was their job. They did it beautifully.

The lawyers, after the manner of attorneys from the year one, were not anywhere near that definite, but this is probably in the nature of the case. It is impossible for them to be so. They did indicate to us the areas where uncertainty existed, which was very informative to all of us. We were told, you remember, that we cannot think in a vacuum, that we must have certain facts. It was very informative to me to learn the fact that we know so little about various legal matters.

In this regard, I had great sympathy for Dean Erickson, who stood up and said, "I have 1,585 kinescopes," (or whatever the figure was), "and if a network comes along, what rights does a teacher have? No, it's not a script." (The lawyers said they could tell us what to do if it was a script.) "It's not a play. It's not a textbook. But the teachers have put something of their own, creatively, into this. Now, what are their rights?"

We found that this was a great problem, and it's nice to know that it's a problem to the lawyers as well as to the rest of us. I am being somewhat facetious. The point, is these areas are not clear, and it's good for us to know that they are not clear. We also learned that if there is no law—and in certain of these areas it would appear there is no law—you cannot commit a crime, and there can be no penalty. This is useful to know also.

The session devoted to the effects of regional broadcasting on the educational community was one of the more interesting that I have ever attended at any conference anywhere. I made a sort of box score of this particular session.

Setting aside the scholarly presentation by Dr. Adkins, who, in discussing "Continental Classroom," was concerned with a completely separate development and whose presentation might very well have been placed in the status report session—my score was: four in favor of educational television, one doubtful, one very, very doubtful, and one flatly opposed.

Obviously it will take a great deal of perusal of the papers, (which seemed interminable at the time) to determine exactly what was said and the nature of the qualifications about educational television expressed by some speakers. Whether all of these papers were as carefully prepared and objectively expressed as Secretary Flemming and Commissioner Derthick advised is, in my judgment, open to very serious question.

The status report session was in sharp contrast to the previous session. First, those who were making reports stayed within the time limit. That was, in itself, a welcome point of contrast. It was also instructive—having seen the fears regarding control expressed in the morning session—to find out that all over the country, in many forms, projects for networks are going forward despite such fears. It was obvious that the educational institutions sponsoring these projects are much less fearful than some who presume to speak for the educational community.

Again there was one very special, separate sort of report in this session which perhaps deserved a session entirely to itself. This was the report in which we were informed of the multiple-channel airborne television project. Airborne television is a subject which I'm sure we will need to learn a great deal more about, a subject which may well be of considerable importance.

I was struck at the time the subject of airborne television was presented, by my recollection of a time in history when the Roman Legion for a thousand years had been absolutely supreme until the Parthians on their fleet little ponies managed to vanquish them. The abandoned city of Petra, with its huge walls, is a monument to the fact that the Legion did not quite keep up with military developments.

Of course, it would have been perfectly possible for the wealth and the might of the Romans to have bred faster little ponies and made more resilient bows and sharper arrows than the Parthians possessed, but they were so accustomed to regarding the Legion as the be-all and end-all of military affairs that they didn't do anything about it, and, thus, they were eclipsed.

It was only six and a half years ago that we put on the air the first educational television station. I'm not saying that every new thing is the best thing, but at the same time that we are complaining about those who haven't quite joined the twentieth century, let *us* not form the cohorts which will be eclipsed by a new development.

Let me now speak very briefly about the two sessions you have just gone through—those devoted respectively to costs and to administration.

The matter of costs was adequately handled and I will not re-document the eccellent reports made. The one thing I wanted to bring out was that the cost figures in general agreed with one another, with the notable exception of Mr. Hurlbert's extremely useful ability to pick up $18,000 and $28,000 items for nothing at all, or almost nothing at all. We can now determine, by merely consulting the record of this conference, what it will cost to establish a regional network of any given size.

I think the subject of administration can be summarized by saying that we determined that there are a variety of ways in which these networks can be administered and financed, but that in any administrative plan, we *must* make sure that *reasonable access* and *academic freedom* are preserved. Not just academic freedom, but also reasonable access, which means freedom not only for ourselves but for everybody else as well.

We were very sure that in whatever administrative plan was used, some method of preserving reasonable access *even to those with whom we may disagree* must be found. Several different methods of preserving this freedom were indicated, and we were unanimously resolved that such methods can and must be employed.

This freedom must be our main end, not administration for the sake of administration but administration for the sake of the preservation of our values, while at the same time we use the networks for all the desirable purposes of which all our panelists spoke in the second session.

Finally, having agreed that the extension of education and the preservation of academic freedom were the two chief goals of network administration, we pointed out that the record—in terms of respect for academic freedom—of those who have been involved in educational television and educational radio is more than just a good record; it is a very proud one indeed. We were certain that the educational community, of which educational broadcasters are an integral part, may well have confidence in our future activities, on the basis of our past contributions to education and to freedom.

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